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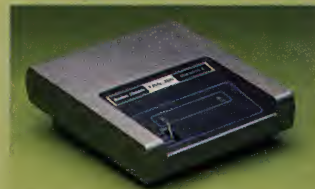


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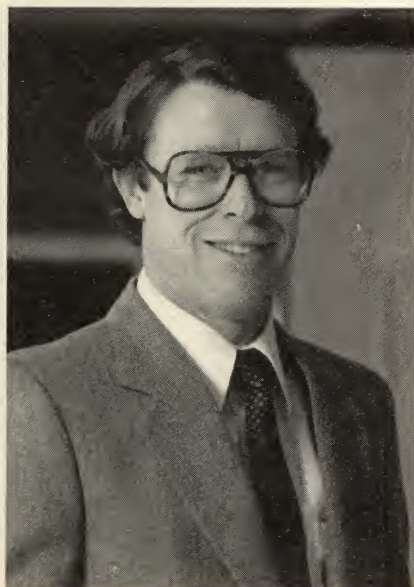
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Dear Reader,

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As a magazine evolves and grows, a reader will often find the old "you may have noticed some changes" routine rearing its head in the opening editorial.

That line usually means the publication has undergone some graphic redesign of one kind or another, or that management is charting a new editorial course.

Although TODAY is making some graphic and editorial changes, the truly innovative projects we've undertaken are not visually apparent.

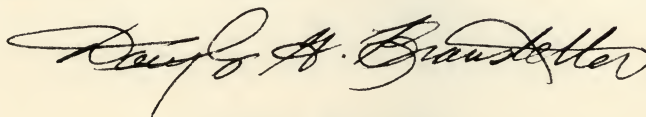
One such project is the TODAY Writers' Network (TWN). Utilizing CompuServe's computer communications network, TWN weaves an assortment of free-lance journalists and editors, videotex experts, business executives, technicians, programmers, academicians and other professionals scattered nationwide into a "staff" that communicates with its editors via computer. That's how a writer in West Virginia can interview the subject of his story who lives in California, write the article, ship it to his editor in Ohio and never leave the microcomputer keyboard in his living room. (See article on page 18)

This extended "network newsroom" concept can revolutionize publishing — not by replacing printed material — but by enhancing it and the manner in which it is gathered and disseminated. As readership continues to fracture under the weight of thousands of splinter-thin specialty publications, (there are dozens of computer magazines alone, and more are born every month) the resulting diluted circulation will make large, in-house staffs economically unattractive.

The "network newsroom" is a viable alternative. It has many of the advantages of a regular staff with fewer burdens. The network concept also has some distinct advantages. Not only can participants in the network communicate with editors, but with each other as well. Tied together with a powerful, efficient electronic mail system, contributors of diverse backgrounds and locales can draw upon one another for professional advice and consultation quickly and easily. TWN members can also tap into the informational databases and special interest sections of the CompuServe Information Service and use its real-time communications capabilities to interview sources. The result is thorough, well-researched editorial material.

Taking the network concept one step further, TODAY is also ushering the advertising field into the Information Age with the creation of Electronic Bounce Back (see article on page 38). Readers who are on line can respond to ads placed in TODAY and the information is instantly relayed to the advertiser. The advertiser can respond to the inquiry immediately via electronic mail and keep the attention of the potential customer while he or she is still actively interested.

TODAY isn't just changing itself. It is creating a whole new approach to publishing. We urge you to become a part of it. Use the Bounce Back system. Give us your feedback on TODAY magazine. Let us know when you or someone you know is using the networking concept in a unique way. You can contact us by regular mail, but use our electronic mail address 70003,1372 — it's faster, you know.



Douglas G. Branstetter
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By Norman J. Wazaney Jr.

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PANDEMONIUM



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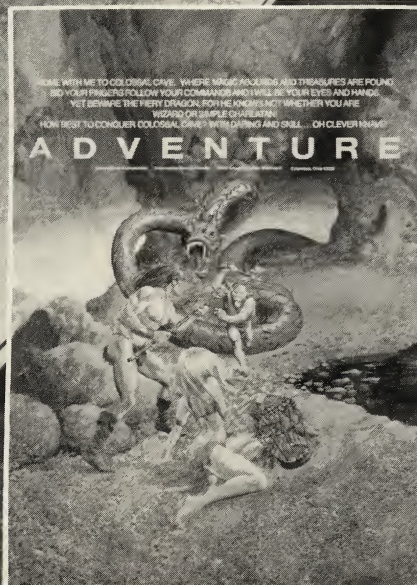
But what was that noise? The Dragon laughs. The only reason he spared your life was because you were wearing an Adventure t-shirt!

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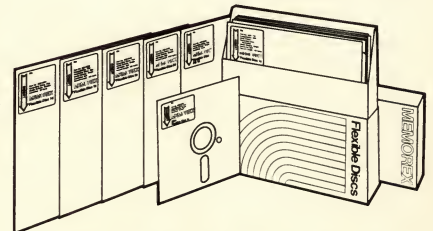
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Software

CREATORS AND CROOKS PLAY HARDBALL

by Kaye Hohmann

The ultimate computer game might be called "Programmers and Pirates." In this game the pirates seem to be winning, the software creators slowly losing ground and the consumer just plain losing...

Modern-day Jean Laffites sail on keyboards, not ships, and brandish codebreakers, not swords. They rob from software creators, merchants, manufacturers and even customers, who are unsuspecting. The trend in software piracy is so alarming that one company has gained recognition for programs that, like Mission Impossible tapes of the late 1960s, self-destruct. Still others tinker with machine-specific programs. And the rumors fly.

"I hear Apple is going to come out with a chip that you plug into your computer before you use the software..." says one.

"I hear 90 percent of the patent cases that go to court don't win..." says another.

"What good does it do to get a copyright?" asks a third.

Everyone gets hurt

In this time when software programs are stolen as lightly as cookies are taken from the jar, creators, programmers and manufacturers have to wonder if there is any protection at all. Many customers are getting hurt when they

purchase programs and find there is no manual.

According to Robert Sirotech, vice president of marketing at Sir Tech Software, Inc., game creators, programmers and manufacturers certainly are hurting too. "People claim it's as high as a quarter of the total games market," Sirotech says. He cites a survey he saw recently, "of 1,800 people, 25 percent admitted they had pirated software."

The problem it creates is that those who spend what can literally be years of their lives creating a game, do not receive royalties from game sales. "Wizardry took the equivalent of two and a half years to develop," Sirotech says. "It is written in PASCAL, and that makes it hard to copy."

However, copy protection is not the reason Wizardry is in PASCAL. Robert Woodhead, co-creator of the game says, "It doesn't have anything to do with protection. It's because we couldn't do it in BASIC. There are 25,000 lines of code. You'd need a Winchester."

In real time, Woodhead says the Wizardry game, which has been at the top of the selling lists since its introduction in the fall of 1981, took 15 to 16 months, with two people working on it. Co-author Andrew Greenberg had written two earlier versions in BASIC. They revamped the design, and Woodhead did the programming in PASCAL. Another game, Star

Maze, took 10 months, and that work was done only on weekends, according to Woodhead. But whether the work is continuous for more than a year or takes two to three months, there is still a considerable amount of time invested by creators. Particularly when 25 percent of the sales are lost, feelings on the issue can be heated.

Bernie DeKoven, creator of Alien Garden, echoes sentiments on the scope of the problem. "Piracy is probably the single most significant force behind the increasing sophistication of software design," he says. "Someone tries to make software uncopyable, and somebody else figures out how to crack the system." DeKoven started in software design with Epyx/Automated Simulations. Now he's working as a consultant with Children's Computer Workshop, a software developing arm of Children's Television Workshop. "Steps are always being taken to protect ideas, games. Copyrights are some help, as are non-disclosure notices, promises, and bribes. But all in all, the only strategy is to get it out first and best—the pressure is great, but it's also highly constructive."

Taking care of business

Although games manufacturers suffer from piracy problems, the degree of piracy in business software depends on to whom you talk. Retailers, like those

Software

at the Micro Center, a computer store in Columbus, don't like to talk about it very much. "First of all, we are interested in protecting our vendors," says Hank Gleissner, sales manager for two of the personal computer lines carried by the store. "We don't see much of it. It's hard to gauge. We do get leery when people say they've lost their manual."

Sir Tech's Woodhead feels business software shouldn't be protected at all. "If you're using a VisiCalc or some \$2000 vertical marketing program developed for lefthanded dentists," Woodhead says, "and your dog chews it, you're up the creek without a paddle and the water is very cold. Frankly, the number of lefthanded dentists who are also pirates is not that high."

"Deadly threat"

One who might disagree is Bob Snapp of Snapp, Inc., a software development and sales company in Cincinnati. Snapp's programs, including popular Snapp Basic, will self-destruct after a certain number of uses. "It wasn't really developed as a means of protection," Snapp says. "It was developed as a marketing tool. Generally, we see our customers as honest people."

Snapp notes that a lot of software is sold by mail. "People are concerned sending a large sum of money to a company they don't know," he explains. "We send them a trial package, a test drive. You take it around the block and see if you like it. Our conversion rate is really quite high." If customers like the trial package, the sale is made and Snapp sends them the disk master. The software is also protected against high-volume copying.

"Software piracy is a serious problem," Snapp says. "The funny

thing is we didn't start out to fight piracy. It is just a small number of people, but that small number is a deadly threat to the industry."

Apple, Inc., as one might expect, is interested in the situation. But after their DOS 3.3.1P protection program was cracked last year, some of the wind was taken out of their sails. An employee who preferred not to be identified, said high-ranking Apple officials have stated that the company is no longer in the business of software protection.

"It's futile as far as I know," says Terri Hasbrouck, product marketing engineer for vendor technical support. "Anything that can be protected, can be broken." Hasbrouck is in charge of licensing Apple compatible products. "We are trying to keep prices for licensing as cheap as possible, but because of the copyright law, those who develop programs for use on Apple computers, using Apple software, have to be licensed."

"I know there is a problem with piracy," she says. "My own experience is that people call up and ask for 30 manuals. They have the software, but want manuals to go with them. We package our manuals with our software." She also stands up for the programmers and creators. "It takes maybe a couple of years to develop these programs," Hasbrouck says. "If they don't get paid, it's not worth the time to develop."

Although piracy is a problem, Hasbrouck says there are some situations where copying is more understandable. Educational institutions are a good example. "We are aware of the need for a policy on that issue," she emphasizes. "Apple is working on a corporate policy for multiple systems for the educational market. We want to evaluate all sides of the problem, and we have to be careful with

what we decide because whatever way we go will set a precedent."

Rumor mill

A number of experts involved in the creation and marketing of software have suggested including in software packages a specific hardware chip that would either plug into an input/output port on microcomputers or would be installed inside the computer to allow the software to run.

One software manufacturer believed the degree of protection would certainly be increased, but that the cost would be prohibitive for games software. Others say that the piracy problem in business software might not be significant enough to warrant such a procedure.

Nevertheless, rumors have persisted among software creators and retailers that Apple is coming out with a chip that would essentially cause a program to run only on a machine that had the "right disk" and the "right chip," whether installed internally or plugged into the computer. That would mean the pirate would have to copy the chip as well as the software in order to copy a program or game.

Bob Martin, manager of marketing technical support at Apple Inc., works primarily on business systems. When confronted with the rumor about Apple developing a chip to add to hardware as a part of a software package he replied, "That, indeed, is an interesting rumor! I can't identify anything we are working on as being that. We are working on cost reduction."

As one who works in the development of business programs, Martin considers protection for software more of a nuisance than anything. "With games, you have to do something," he admits. Martin says that there is a hardware

Software

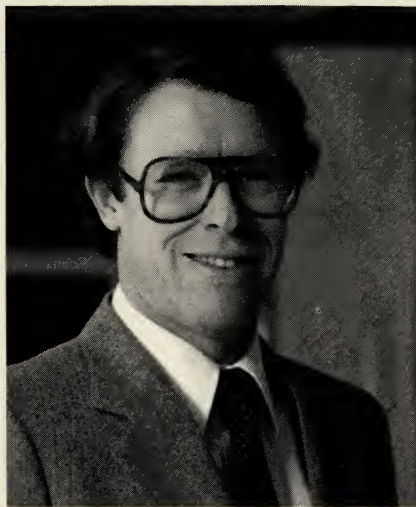
board that can be attached to personal computers that writes the contents of disk memory onto another disk. "The second disk is bootable," he says, although he is not sure why anyone would want to go to the trouble.

The legal picture

So what's an author to do? Is there any kind of real protection out there? And if so, how do you get it?

The kinds of protection creators can receive depend on the stage of the creative process. Software "authors" should know that they receive the same kinds of prepublication protection afforded authors of books, magazine articles or other created materials. "Unpublished works are covered under the new copyright law, which says that copyright begins when the work is fixed," says Barry S. Bissell, patent and licensing officer at Battelle Development Corporation, the invention development and licensing subsidiary of Battelle Memorial Institute, the largest private, non-profit research organization in the U.S. "Under the old law, you had to publish it to receive Federal copyright protection," he says "although there was some common law protection for unpublished works."

Bissell, who notes that the opinions he expresses are his own and not necessarily the corporation's, says that should a company become interested in your idea, they will very likely ask you to sign an agreement that says, essentially, if they accept the idea, the relationship between you and them is not confidential. On the other hand, if you use a portion of anyone's software in your program, you must receive permission, possibly in the form of a license, for which there may be fees. "If you are using their code in your pro-



Barry Bissell of Battelle Development Corp: "Hardware manufacturers love cheap software"

gram, you will probably need a license to use it," Bissell says. "If not, you probably don't."

Protection Options

Once created, there are several options you could use to protect it from being used in an unauthorized fashion. Or if it is pirated, you can at least seek compensation via legal avenues. The options, according to Bissell, are patents, trade secrets and copyrights.

"Patents," he explains, "can't cover software per se, because it is non-statutory subject matter. The U.S. Supreme Court recently said that software could, however, be a step in an otherwise novel process. It doesn't make the process unpatentable. Formerly it did," he explains. In the opinion of the Court, Bissell says, software itself is not patentable.

"That leaves you with copyrights and trade secrets. A trade secret is something of value that gives the owner an edge over the competition. It is generally not known to the public," Bissell says. Examples might be know-how, ideas, blueprints, software, information. Even the well-guarded

formula for Coca-Cola is a trade secret. The concept is broad in scope," he continues, but it is a non-statutory type of protection. It is generally state protected." This distinguishes it from federal protection, which patents and copyrights have. Additionally, because trade secrets are protected by state law, they differ from state to state. "They are included in the laws that regulate unfair competition and breach of confidential regulation. Not all states have the same definitions. But virtually all will protect software under some act of confidential relationship between owner and discloser."

In what seems to be a circular argument, to keep a trade secret, you have to prove you kept it secret. You can only seek damages if a person who agreed to keep the information confidential disclosed it or used it. If a third party gains knowledge of your secret or your process, and, according to Bissell, if that knowledge is not part of a confidential agreement, you cannot stop or seek damages from the third party. "These kinds of problems with trade secrets usually mean they are not a great thing for a small program," Bissell advises. "They are often used in large programs where you are dealing with a detailed contract."

That narrows the individual's choices to copyright protection. "It can cover anyone (seeing the work) who receives notice (the copyright notice on your work), as long as requirements are followed. Copyright protects against copying," he says.

What's more, copyright can give you legal clout against those who copy your program. "If you are willing to find someone who copies your program," Bissell notes, "you can stop them from copying and recover damages." You can get statutory damages and attor-

Software

ney's fees, even if you can't prove actual damages. If you have registered and received a copyright for your work you can collect up to \$50,000 in statutory damages.

One of the problems with the software issue, Bissell explains, is that there is "not a lot of case law outlining how much protection people actually have. Cases are still pending under the revised copyright law." Recently, however, MicroPro International and Digital Research Inc., won a suit against Data Equipment, Inc. In the suit MicroPro and Digital Research charged that Data Equipment had produced and distributed unauthorized copies of WordStar, DataStar, WordMaster, Mail Merge programs and the CP/M operating system. The settlement calls for Data Equipment to pay \$250,000, legal expenses, and, in addition, the chairman of Data Equipment will personally have to pay

MicroPro and Digital Research \$30,000.

Federal fumbling

Until recently, another problem has been the copyright office itself. Marybeth Peters, chief of the examining division of the U.S. Patent Office said in a recent speech, "The way the Copyright Office developed how they deal with the electronic video games is a history in how not to deal with the new technology. It is close your eyes and register what you have in front of you." Peters points out the office has revamped its practices.

"Producers of the game quickly picked up that if you only register the computer program," she said, "you are imperfectly protected because you can have the same object code and different visuals." But what happened was "our examiners were just passing anything

that they could because it didn't mean anything to them... In fact, in some cases where it was on microfilm, I found out that no examiner even looked at it. Why? The microfilm reader was under the table and you have to take the microfilm reader up and put it on the table and plug it in... We have stopped all that," she assured listeners.

Now, to register properly, authors, creators, must send source code. "... we made a decision that the authorship, the human authorship that goes into the computer programs is really best represented by the source code or source format. Anyone who sends object code to the copyright office will now receive a letter that says registration is being delayed pending the receipt of the source code or source format." According to Peters, this is the same procedure they follow when they receive videotapes from Europe in a format they can't examine. They will register with the object code, but it will be under rule of doubt. No one has provided a good definition of what rule of doubt means, nor what, if any, protection it might offer. The best protection, is with the source code.

In special instances—if up to 50 pages of source code is sent with object code—the copyright office may register it. The terminology for this procedure is called special relief. "We would like enough there to know that there is some kind of copyrightable authorship," she summarized.

If you have created a software program and want protection for it, Bissell suggests you check with an attorney about protection. "There are so many specifics (in an individual software program), in different situations. It is important for you to check. To publish,



Micro Center's Gleissner: Retailers don't like to talk about piracy very much

Software

distribute publicly, you need to register. And you must send a deposit copy to the copyright office."

The source code is the only language you can be sure will result in a receipt of copyright protection. "Human readable, or English language version, is what they call it," he says.

"Individuals should also remember that large companies are not necessarily as concerned about software piracy, particularly if they are selling hardware. Software companies," Bissell points out, "might feel differently. Hardware manufacturers love cheap software."

Both computer and software companies accept ideas and programs from outsiders. Creators such as DeKoven, prefer to work as outside consultants. Robert Woodhead, however is part of the company. Should you submit an idea, Woodhead advises you to write down the program, make copies and mail them to yourself

and your lawyer, and call the company saying you have an idea. Sirotech mails out a non-disclosure kit which an author has to sign. It says, according to Woodhead, that they won't steal the idea. "We look at it. Evaluate it. Maybe find someone to program it." However, Woodhead cautions that 95 percent of the material his company receives is unpublishable for one reason or another, many times because it is too much like something that is already on the market.

Apple has two programs for those who submit ideas. One is for those who wish to use the Apple system to create software they plan to market themselves or sell to a software publisher. A different division handles the ideas that are submitted to Apple for possible publication by Apple, Inc.

The problem of piracy will be with us for a while to come. Woodhead feels that the only valid solution is for people to realize it's wrong and stop doing it. "They

have to catch and make examples of people." He feels the trouble with a "get-tough" policy is that the ones likely to get caught will be ones without a lot of experience, and more than likely not the ones who are creating the biggest problem. "I'd hate to take a 14-year-old to court," he says.

"Part of the fun of piracy," says Apple's Bob Martin, "is getting a disk that says 'I bet you can't copy this.'"

But perhaps Bernie DeKoven, game creator, has the best outlook, at least for the present. "Basically, I see it as a game, and even though the manufacturers and pirates are on different sides, the game is having some highly revolutionary and evolutionary consequences... It's a game. And as long as we are selling software, we'll be playing it, and anyone who is trying to crack down on pirates is just being a spoilsport."

Kaye Hohmann is a free-lance writer from Columbus.

APPLE WANTS YOU ...SORT OF

If you have developed a software program, you may be interested in sending it to a hardware/software or a software-only company either for evaluation or for permission to use their system in a product you market. Apple is set up for all contingencies. If you want to use the Apple software in your product, according to Apple's information, you need to have a special license to do so. Licensing allows you to incorporate Apple software in your product and makes possible direct communications with people who can be of help. The people to whom they

refer are technical advisers and support personnel who will answer questions you have along the way.

For a larger fee, you can also have the DOS 3.3.1P protection system, which Apple admits has been broken. However, they also feel that some protection may be better than no protection. DOS 3.3.1P protects from being copied by FID and COPY.

You can also submit an idea or a program to Apple for possible publication. It will go to their software evaluation group. The whole process takes about 45 days, according to Apple literature on the subject. To submit, the software must be completed and accompanied by a manual. When it is received, you will be sent a letter. The program will be reviewed by

the Software Acquisition Group. They then submit a report to the Product Selection Board. "All inquiries are held in the strictest of confidence," they say in the form. After review by this group, you will receive an acceptance, rejection or a referred response. If the package is being held for extensive evaluation, a letter will arrive saying so. Two critical areas are considered in evaluation, according to Apple information. They are technical stature of the program and the marketing viability of the program.

If you are interested in the Apple program for software creators, call or write Apple Computer, 20525 Mariani Avenue, Cupertino, Calif. 95014. We might add on the basis of our experience, it's faster to call. Much faster.



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TODAY
THE VIDEOTEX/COMPUTER MAGAZINE



George Olson

Andrew Fluegelman and alternative publishing: Veterans of the software piracy wars called him a cockeyed optimist

FREE WARE

**An Optimistic Approach
to Software Piracy**

**By Charles Bowen and
J. Stewart Schneider**

Fellow man.

It's the kind of faith that, if contagious, could spawn a whole new kind of marketing in the micro-computer community.

At a time when major software houses are spending tens of thousands of dollars in what some say is a futile effort to protect their programs against pirates, a man named Andrew Fluegelman gives his programs away.

It's called "Freeware," and to those who've been burned before by the deals of software hustlers, it sounds disarmingly straightforward:

You send Fluegelman a blank disk and postage (but no money) and, by return mail, he sends you a copy of his program. You try it out, and if you like it and decide to use it, you are invited to send him a "contribution" — he suggests \$25. Or you could send nothing. The choice is yours. Further, rather than discouraging piracy, he urges you to make copies for your friends, and he offers them the same terms — pay him if they like the program.

When the 39-year-old Tiburon, Calif., man introduced the Freeware concept on the bulletin boards of CompuServe and The Source last April, veterans of the

software piracy wars called Fluegelman a cockeyed optimist, doomed for disillusionment. After all, he was a rank neophyte in the software marketplace — a year earlier, he had never even touched a personal computer.

But Fluegelman was no stranger to alternative forms of publishing, and these days many people are not so quick to dismiss Freeware as just so much blue-skying.

Six months after announcing Freeware's first program—a communications package for the new IBM personal computer called "PC TALK"—Fluegelman says he had distributed more than 1,500 copies and collected some \$15,000 in contributions. He also made some pretty good friends.

In fact, the feedback from recipients of PC TALK has convinced him that Freeware is not just a novel way to distribute one program. Fluegelman is convinced that "user-supported" software is at least a new marketing concept, and just may be the boon creative programmers are looking for.

"The best part of that feedback is that it never comes in the form of complaints or gripes," Fluegelman says. "Users appreciate the spirit in which the software is being offered and they offer their comments in the same spirit."

Much of the feedback has been suggestions from users on how to improve the program, resulting in two upgrades already.

"I received many good suggestions from users about how to deal with their special hardware/software needs," he said. "I couldn't have anticipated all of them. You asked how I managed to educate myself so quickly in such a complex field as computer communications. I'd definitely have to credit and thank my 'subscribers' for providing so much good information."

Birth of a Concept

In a sense, the idea of Freeware was eight years in the making, growing out of the several careers Andrew Fluegelman has had in the past 15 years.

After graduating from Yale Law School in 1968, he practiced corporate law in his native New York City and then in San Francisco. But after five years, he became "a 'victim' of the late '60s" and discontinued his law practice. He wound up as managing editor of The Whole Earth Catalog for about two years.

In the late 1970s, his interest in publishing heightened by his experiences with the Whole Earth products, Fluegelman struck out on his own and established an independent book producing firm. The Headlands Press since has created books independently and sold them to national publishers for distribution, "much the way that independent film and record producers work," he says.

Headlands' credits range from two game books for Doubleday to "A Traveler's Guide to El Dorado and the Inca Empire" for Penguin to the upcoming "Grateful Dead: the Official Book of the Deadheads," for Morrow—"an eclectic list," he admits, but one that "has happily allowed me to pursue interesting subjects."

While pursuing just such a subject, Fluegelman came upon microcomputers, a new editorial assignment — and yet another career.

"Last year, I was looking for a new book project and decided to do a book about word processing. (The result: "Writing in the Computer Age," written with Jeremy Joan Hewes, to be published this February by Doubleday.)

"I just happened to be shopping for a computer when IBM announced its Personal Computer

and I wound up becoming one of the first owners of the PC. I immediately became fascinated and addicted to the machine."

Fluegelman's joy with microcomputing soon had him writing reviews of software and eventually led to his accepting a position as associate editor of the new PC Magazine for IBM users.

Fluegelman's journey into the software business came a few months later.

"As Jeremy and I were starting to work on our book, it became necessary for us to send drafts back and forth between our computers," he says. "IBM had released its own asynchronous communications software, but it was very limited. Aside from what has been generally acknowledged to be a 'clunky' program design, the software could only communicate with other PCs at the micro level. Since Jeremy was working on North Star running CP/M, I had to figure out how to communicate with her, so I started writing my own communications program."

That BASIC program was the beginnings of PC TALK. It was originally intended only for Fluegelman's personal use, but a few friends started using it and convinced him that he should try to market it.

So far, the story of PC TALK is fairly common among a new breed of software authors who turn their personal programs into marketable products.

"I think that if I had not just spent the previous eight years dealing with traditional marketing approaches — publishing, royalties, advertising, distributors, etc. — I would have jumped ahead and gone that route," he says.

"But I felt I had just immersed myself in a new field — had created something in a new medium

— and somehow the thought of treading those same, familiar selling paths didn't seem very exciting."

During those days of the final polishing stages for PC TALK, Fluegelman was watching the local public TV station, KQED, holding its annual pledge drive. "The idea for 'user-supported software' popped into mind."

"Network nation"

The idea born casually during a moment of relaxation has since grown into three basic principles of the Freeware that Fluegelman has written into a policy statement:

— First, that the value and utility of software is best assessed by the user on his/her own system. Only after using a program can one really determine whether it serves personal applications, needs and tastes.

— Second, that the creation of independent personal computer software can and should be supported by the computing community.

— And, finally, that copying and networking programs should be encouraged, rather than restricted. The ease with which software can be distributed outside traditional commercial channels reflects the strength, rather than the weakness, of electronic information.

Fluegelman chose to spread the word about his new program solely on the computer bulletin boards of CompuServe and The Source and on some smaller systems such as the Capitol PC Users' Group in Washington, D.C. He has never advertised in a print publication, and, looking back on it, he realizes the "network nation" was instrumental in the philosophy of Freeware.

"There is a special quality about computer networking that makes

Freeware work," he says. "After all, the Freeware concept came about precisely because of the free exchange of information that the computer age offers."

Legalities

Of course, any new concept is bound to have some new legal questions attached to it. In Freeware's case, can you copyright a program you "give" away? Do you have any legal recourse if someone "steals" it and starts marketing it as his own?

A touch of guilt

And something else—just a touch of guilt. Each time you run PC TALK, the first thing you see is a notice reminding you that the author is asking for a \$25 contribution if you like the program. Fluegelman says that these two motivations—the better nature and the guilt factor—working in concert are what make Freeware successful.

"If someone finds the program useful and adopts it as their regular, day-to-day communications

"There is a special quality about computer networking that makes Freeware work"

Fluegelman says yes to both questions. PC TALK carries a copyright notice in its title page, along with a "limited license" to the recipient to use and copy the program and a request for a contribution. Fluegelman admits that the validity of the limited license may be questionable under current court precedent, "but, of course, the law responds to new economic and moral situations. I don't think it's possible to offer an iron-clad legal opinion about what Freeware really is and how and to what extent it can be protected."

He says he believes if some one else tried to market PC TALK, he'd have a pretty good shot at going into court and making him stop and/or pay damages. However, he insists the plan is not based on a strong legal protection. Instead, it depends on people's better nature.

program, the Freeware notice will remind them that they have received something of value. How 'guilty' they feel is up to them. But that situation is no different than someone making a copy of a commercial program and using it without having paid for it.

"The one wrinkle with Freeware is that the program became available to the user with no strings attached. The implied offer is to try the program first and pay only if the user finds it worthwhile.

"And that's where 'guilt' starts becoming transformed into 'good faith.'"

Fluegelman notes that almost every contribution he's received has been accompanied by a personal note saying how much the user liked the program and how pleased he is to be making the contribution.

So, could someone make a living distributing user-supported programs?

Freeware has not allowed Andrew Fluegelman to just sit back and watch the money roll in. Book publishing and editing is still his primary source of income. And, he's had to hire a full-time assistant to help with the paperwork involved with the software business. Requests for PC TALK have increased from 15 to 25 a week back in June to about 15 to 20 a day in October. And Fluegelman still keeps records of all the people who requested the program — "the Freeware network" — so he can notify all the contributors of upgrades to the program.

"There's no question that Freeware has not been losing money," he says, "but, frankly, I'm not sure how well it would support someone over the long haul."

On one hand, Freeware saves money on what are generally "high-ticket items" in traditional software distribution — advertising, software protection and materials (disks and tapes).

No goldmine

From a purely economic viewpoint, one of Freeware's major problems is the dropoff in contributions from the "secondary users" — those who accept Fluegelman's invitation to get a copy of the program from a friend under the same "limited license." Fluegelman says he eventually receives contributions from about two-thirds of those who send him a disk and request a copy of PC TALK. However, he estimates only about 15 percent of the second-generation users become contributors. (The reason may be psychological, he notes. The secondary users didn't initially "invest" a disk in the experiment, and without that investment,

there's less incentive to pay.)

"So Freeware hasn't turned into a 'circle of gold' just yet," Fluegelman says, "but I can't get upset or be too concerned with that part of it. After all, the whole point is not to put any energy into worrying about 'unauthorized' copies."

The Freeware experiment is successful enough that Fluegelman says he plans to continue it this year on several fronts:

First, a new version of PC TALK (Version 3.0) will be available by the time this article is published. He plans to send all prior contributors a voucher for credit to update for the cost of mailing and a disk.

Secondly, Fluegelman is looking for other programs to distribute under the Freeware banner. He hopes eventually to publish a catalog of user-supported programs available from their authors. For the purposes of the experiment, he would like to see a user-supported game program. He realizes that PC TALK owes part of its success to the fact that it was a "serious" utility program for a relatively new computer. Had the first Freeware offering been a game program for a machine like Apple, the percentage of contributions might have been lower, but on the other hand, the overall distribution might have been larger.

If the Freeware experiment catches on, it could play an important part in the state of the art of microcomputer programming, Fluegelman believes.

"Up to now, distribution of software has relied either on restricting access (and charging for the cost of doing so), or anonymously casting programs into the public domain. The user-supported concept might — just might — be a way for the computing community to support and encourage creative

work outside the traditional marketplace.

"If one is going to distribute a program for 'free' and hope for voluntary contributions from users, the program has got to provide the same level of friendliness and support that one would expect of a 'commercial' product."

Ultimately, Freeware is an experiment in economics more than altruism, its creator says.

"Free distribution of software and voluntary payment for its use would eliminate the need for money to be spent on marketing, advertising, and copy protection schemes. Users could obtain quality software at reduced cost, while still supporting the program authors."

"And the most useful programs would survive, based purely on their usefulness."

Anyone wishing to communicate with Andrew Fluegelman can reach him c/o The Headlands Press, Inc., P.O. 862, Tiburon, CA 94920. His CompuServe ID # is 71435,1235.

Charles Bowen is a journalist with 16 years experience in the newspaper business, including eight years as city editor of the Huntington, (W.Va.) Herald-Dispatch. J. Stewart Schneider is an attorney in Ashland, Ky. Bowen and Schneider manage Saturday Software, which is dedicated to writing programs for home computers and articles about the computing community.



PIONEERING THE ON-LINE INTERVIEW

Editor's note: Free-lance writer Charles Bowen conducted the interview with Free-ware developer Andrew Fluegelman via CompuServe's computer network. Bowen relates his experience with this new interviewing medium in the following article.

I have a confession. I've never met Andrew Fluegelman. In fact, you and I are finding out at the same time what Andrew looks like.

I interviewed the Californian for more than two hours in my living room in West Virginia one Saturday afternoon in October, and neither of us left home. We talked through our computers.

Anyone who's been networking for a while is familiar with conferencing. It's still a kick for me to chat on CompuServe's CB simulation with somebody across the country, but this was the first time I'd used the conference mode to prepare an article, to explore what may be a new reporting tool—the electronic interview.

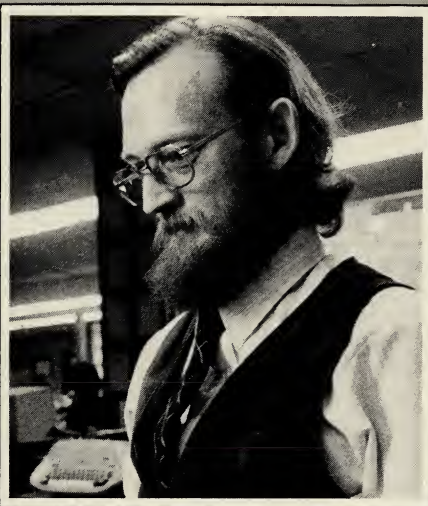
In 16 years of newspaper experience, I've noticed that the quality of an interview often is affected by its medium. A telephone interview, for instance, produces a different kind of quote than one conducted face-to-face, and comments from a subject sitting behind his desk in his office are different from those he might make when you're walking with him through the park.

In the same way, according to a friend in the television news business, interviews before old film cameras differ from those conducted in front of new videotape cameras because the newer ones are quieter and use a less expensive tape. This means the subject

usually is more relaxed because he's not distracted by a noisy machine or a fidgeting, cost-conscious reporter.

The on-line interview, more than any other medium, is a cooperative effort between writer and source.

Obviously an electronic interview is slower than one done face-to-face, so both Andrew and I had to prepare in advance. I was familiar with Fluegelman's Free-ware concept. I had studied the transcript of a conference he had last June with the members of CompuServe's "Software & Authors Special Interest Group" and made written questions. Before the



Tim Gröbe

Charles Bowen: The on-line interview is a cooperative effort between writer and source.

interview, I gave Fluegelman an idea of what I'd need elaboration on, so he could organize his thoughts and prepare disk files he might want to upload to me during the talk.

The success of this kind of interview depends largely on how comfortable the subject is at a keyboard. Andrew is a writer and an editor, very much at home writing out his thoughts. My interview might not have gone so smoothly with someone less "word-oriented."

There are other limitations to the electronic interview. For instance, I had to have an "understanding" with my source that I be given a little leeway to make his direct quotes more readable and conversational, without, of course, a wholesale re-write. The problem with a fully written question-answer session is that people don't usually write as they speak. A reader expects the material inside quote marks to "sound right," which meant I needed a free hand to change remarks like "some persons did not" to "some people didn't."

Some of the problems inherent in this kind of interviewing I didn't foresee — the physical strain on the source, for instance. For me a on-line conference was great—I could ask my question, and then go feed the cat, or even run down to the mailbox while a detailed answer is coming in. But for the interviewee, it's two to three solid hours of typing. Next time I'll suggest we build in some rest stops along the way, to allow my source to take a pit stop, make a sandwich or just stretch.

Photography for this article was obviously a problem. Andrew could send me any text he wanted through his terminal, but a computer can't take his picture for me (at least, not yet). TODAY scheduled a freelance photographer in Fluegelman's neighborhood to take the photos after the interview, and I didn't see them until this issue was published.

I don't think the electronic interview will ever replace the good old face-to-face encounter. Too much insight can be gained from facial expressions, gestures, and other non-verbal communication to give up that journalistic tool. But for a writer in West Virginia to interview a subject in California, it's the next best thing to being there.

HOMESTEADING WITH A HOME COMPUTER

by Carole Houze Gerber

Describing home computers as part of a technological "new frontier" is not a particularly startling or original idea. But comparing the opportunities they present users with the Homestead Act of 1862 certainly adds a new twist.

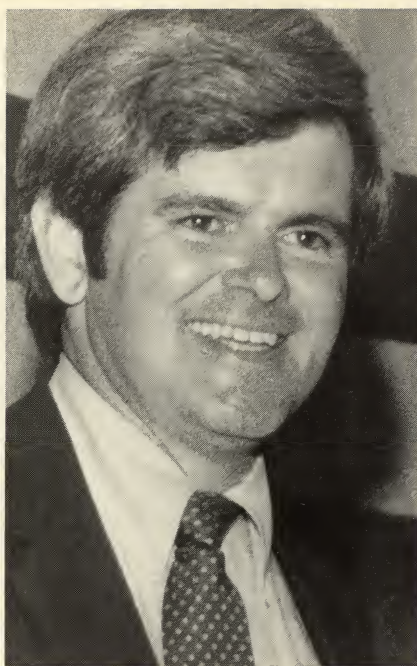
To U.S. Rep. Newt Gingrich (R-Georgia), who in May 1981 sponsored legislation that offers tax rebates to stimulate the purchase and use of home computers, the parallels are obvious.

"One of the great social breakthroughs in American history was the Homestead Act, which offered 160 acres of public land free if it was lived on and cultivated for five years," explains the college professor-turned-politician. "If people were willing—no matter what their backgrounds—to take the land and work hard, they could better themselves. The Family Opportunity Act I sponsored offers the same type of chance, only it's through mastering technology rather than cultivating the land."

Gingrich's bill offers a \$100 a year, per eligible family member tax credit for up to 50 percent of the cost of a home computer and related software. The taxpayer has five years to write off the investment. The official language of the bill, H.R. 6397 states that the computers must be use primarily for educational, professional "or other essentially non-recreational use in the home."

New society

Just as the Homestead Act offered a unilateral opportunity for Americans to better themselves, Gingrich says passage of the



Rep. Newt Gingrich: "legislating a conservative opportunity society"

Family Opportunity Act can benefit all segments of society. Specifically cited as the purposes of H.R. 6397 are to "increase individual opportunity, expand the potential for individuals to own their own businesses, restore the family setting by allowing families to learn and earn together at home, develop opportunities for America's handicapped and disabled citizens, provide a growing pool of computer-literate young people who can enter the jobs of the future and man the sophisticated military of tomorrow, and to decrease home-to-office commuting and national dependence on imported oil."

That is admittedly a tall order for a bill that has languished in the Ways and Means Committee since its introduction last spring.

Gingrich, however, is optimistic. In fact, he virtually glows with the zeal of one committed to a larger cause. The Family Opportunity Act is one step, he believes, in helping the United States "make the transition from a liberal welfare state to a conservative opportunity society."

One way this will happen, says Gingrich, is by shifting the burden for learning onto the individual.

The computer's enormous potential for bringing education and training into the home setting makes it a natural for creating the self-sufficiency Gingrich preaches. And because computers are becoming cheaper and easier to operate, he feels they are within the reach of all Americans.

"This bill is directly aimed at anyone willing to work hard enough to pay \$100 a year in taxes," he asserts. "If someone really wants to master computers, they need enormous patience. Computers don't mind repeating something two hundred times to slower learners. Becoming computer literate takes drive and patience—it does not take a great deal of education. In the age of free public libraries, especially as libraries increasingly offer computer facilities, there is no reason to be information-poor."

Gingrich has taken steps to test some of the benefits outline in the Family Opportunity Act. As a result of talks with—among others—the Chase Manhattan Bank in New York City, some businesses will begin soon to have programmers and others with computer-related jobs work at home. Chase is currently working on an arrangement to have 20 people try it on an experimental basis. Gingrich says. "If we could have the middle class owning its own means of production (computers, in this case), we'd externalize a lot of the cost in white collar productivity," he adds enthusiastically.

Technological edge

A man who practices what he preaches, Gingrich uses a micro-computer in Congress and toted a portable terminal during his reelection campaign last fall. A student of information sciences since

Continued on pg. 48



AN ANTIDOTE TO POWERLESSNESS

by David Kull

The complaint has become familiar: The once-competent, well-adjusted achiever seems unable to get *anything* done. The harder and longer he works, the less he accomplishes because he tires easily and often feels tense. His drive turns to cynicism, his warmth to impatience. Furthermore, constant striving for unreasonable goals has shredded his sense of control over events and his self-image. Piecing them together isn't easy, but help may be available from an unexpected source — the personal computer.

The friendly terminal isn't about to replace the understanding spouse, buddy or therapist as a source of comfort for the victim of burn-out, though computers are beginning to play a direct role in some formal therapies (See box). Instead, the machine offers its primary antidote in the analytical, computational and organizational powers it lends to those who suffer essentially from a sense of powerlessness.

Productive meditation

The computer's stress-reducing effects are both actual, in that the device can ease the strain of existing business and personal chores, and intangible, in that it gives the user a therapeutic sense of control — even if he is controlling only a machine. Therapy patients are beginning to take advantage of both benefits.

"The personal computer can provide an opportunity for people

to focus away from the real-life stresses they're experiencing." Dr. Richard Samuels, a psychologist in Teaneck, N.J., says. "They can concentrate instead on a structured task or game. The ease with which one can become totally absorbed in the computer makes working with it almost a form of productive meditation."

The computer also offers the victim of stress the chance to take command of a complex, yet ultimately controllable system. Mastery of the machine can provide a special lift for those who must deal with intractable, frustrating problems in the real world, especially in their businesses.

"Resolving problems in the computer's operation gives the individual a sense of control, a feeling of gratification," Samuels adds. "It recharges him."

Psychologist Herbert J. Freudenberg, whose book, *Burnout: How to Beat the High Cost of Success* (Bantam, 1981) helped bring the problem of coping into national focus, agrees.

"The personal computer can help maintain peace in your life," he says. "When you use it, you become orderly in your thinking — and more in charge."

One of Freudenberg's patients, an advertising executive who sensed that his outlook was becoming increasingly cynical and depressed, found relief in his personal computer, but he has a slightly skewed outlook from his therapist's. He saw the *limited* control the personal computer al-

lowed as an attractive alternative to his routine.

"It seemed as if everything in life had become negotiable," the executive says. "But the computer doesn't accept any negotiations. It will do what you want, but only if you follow the rules. You can't persuade a machine."

Another habit?

The satisfaction of controlling a computer or operating in a realm where the rules are clear and uncompromising can be a trap for some people. The feeling of control and well-being, instead of providing a temporary renewal that allows an energetic return to life's struggles, becomes an end in itself. People sometimes delude themselves with false feelings of success. They'll escape into the computer while their real problems continue, and the computer's comfort will postpone resolution of real-world problems.

The antidote? According to Samuels, people should give thought to when and why they're heading off to use the machine. If they feel compelled to seek out the keyboard continually in moments of stress or discord, the computer has become part of the problem.

"You're using it as a drug," Samuels says. "You've become a computer junkie."

Because of the computer's addictive qualities, use of the machine is not recommended for compulsive persons, some of whom Samuels fears "might get lost in the terminal and never come out."

Freudenberger agrees that the power one thinks he has over the computer can be a dangerous lure.

"Some people use the computer as a substitute for the real world. The computer becomes an obsession," he says. "But if you don't see it as merely an adjunct to your life, you give the machine powers it doesn't have."

While commanding the computer can be either satisfying or addictive, failure to control it can be only frustrating — particularly for high achievers who are prone to stress-related difficulties. One of Freudenberger's patients recently had to pack away his personal computer for awhile because it was hurting more than helping.

"As in his daily life, he tried to do too much with the computer so his programs never worked," Freudenberger says. "It was an ongoing source of frustration."

Playful possibilities

Even those who are not adept at programming can take comfort

from the computer. "Just seeing something so complicated operate as a game can be gratifying," Samuels says. "It produces hope because the computer is complex, yet it's working. The world is also complex. Therefore, it too can be made to work better."

A victim of too much stress often cuts himself off from family and friends. And someone who has difficulty communicating to begin with is prone to coping problems since he cannot easily ask for help or enjoy the comfort of sharing feelings with others. The computer helps draw such people together with others and eases communications for them. It can be a spellbinding toy. In fact, the computer as a toy has brought isolated patients in closer touch with their families. The machine is particularly powerful in helping parents and children communicate better. Since children are normally less awed by computers than adults, they can participate in games and programming prob-

lem-solving on a more even footing than they enjoy in most family activities. Parent and child share equally in the satisfaction of exploring the machine's capabilities and solving its puzzles together. Usually, whole families are drawn into the fun.

"Often it starts when the father buys a computer for his children," Samuels says "But the machine is so seductive that eventually all family members are pulled in. It becomes a focus of household entertainment, the way the television has been. The difference, however, is that the computer requires active participation, while television permits everyone to sit back passively with his own thoughts."

A case in point

One of Samuels' patients had sought the psychologist's help because of feelings that he, his wife, and two stepsons lacked togetherness. Having been prescribed the use of the computer, he de-

PROBLEMS? TELL THEM TO THE COMPUTER

"Hello, Harold, what would you like to talk about today?"

"My boss."

"Why do you want to talk about your boss?"

This exchange would not be an unusual opening dialog between a therapist and his patient. But it could just as well be the start of a conversation between a computer and its user. Researchers in artificial intelligence have long experimented with programs that allow computers to "converse" with humans. The machines usually respond in noncommittal, thought-provoking terms—much like those

an analyst would use to draw out a person's feelings.

The mental-health community is not quite ready to put this conversational software to work treating patients. But one commercially available program allows a personal computer to discuss its user's problems, and psychologists are finding computers helpful to their practices.

The commercial program, "Eliza," is available from Tandy (\$14.95) and on the CompuServe Information Service (GO GAM-15), and offers to discuss any problem the user wishes. It responds to key words and grammatical constructions to keep the conversation on track.

Currently, the computer's more

serious contribution to psychotherapy is in psychological testing. Dr. Richard Samuels, a clinical psychologist in Teaneck, N.J., has his clients take a variety of psychological tests at the computer keyboard. The technique holds a number of advantages over the traditional pencil-and-paper approach, he believes.

For one thing, Samuels reflects, the machine's "human-like" qualities put people at ease. The programs address clients by name and mix friendly comments in with their instructions. Samuels also finds the computer helpful in taking case histories.

Another testing advantage of the computer is its ability to use branching logic to present the most

scribed its effect on his family.

"We didn't really share any interests," he says. "In the evening, the kids would play by themselves. My wife might read a magazine or cook, and I'd putter in my shop."

So, when Samuels suggested computing as a family activity, they gave it a try. Since the patient "knew nothing about computers," a relative who was a hobbyist helped him pick out and get started with a TRS-80.

"We use it three or four nights a week," the patient says. "We play games and my wife and I work out our budget on it. The family now has a common interest, and that's good." They have had the computer about a year. While the novelty, and some of the initial excitement has subsided, the fun and togetherness remain.

"I'm learning BASIC and the boys, who are eight and nine, are starting to write little programs of their own," the patient enthuses. "The computer hasn't been a magic



Mark Ulrich

"With the computer, you have to organize your universe and really understand the problems you are dealing with."

solution to our family problems, but it helped."

Romance enhancer

Computer games can also help in developing new relationships, a characteristic with distinct mental health advantages in many situations. The executive who felt comfortable with the computer's lack of persuadability, for example, also occasionally enjoyed its "persuasive" qualities. Re-entering the dating game after his divorce, he found that the invitation "to come up and play with my computer" was a successful, if amusing, update of the traditional "Would you like to see my etchings?" gambit.

The nationwide computer network, CompuServe, in which subscribers link their personal computers to central mainframes via telephone, provides another way for the isolated stress victim to combat loneliness. The service allows individuals scattered across the country to play long-distance

efficient line of questioning. Depending on an individual's responses, the program skips irrelevant questions and focuses on key ones.

The computer also helps those people who administer tests at Samuels' clinic. The famous Rorschach inkblot test still requires a human administrator to classify responses, for example. But the computer will assess the assigned values and print out a report on their meaning.

Perhaps the most important benefit of computer testing, Samuels feels, is its rapid-scoring ability. Usually, many of the tests must be sent out to scoring services and results are not available for one or two weeks. With the computer,

though, they are provided immediately.

"We're able to go over results shortly after the client takes the test," Samuels states. "The immediate feedback has a strong impact on the individual, and it avoids the uncertainty of a lengthy wait for answers."

Samuels sees even more dramatic use of computers in therapy just around the corner. One application now under development, he says, employs the machine to enhance a technique that is already helping people overcome specific phobias. The approach, behavior therapy, allows a patient to confront his fears gradually. Someone who is afraid of flying might begin the therapy

by looking at photographs of airplanes. Next, he might watch a film of an airport waiting room. Then, one of a plane taking off. Over time, as he becomes more comfortable with increasingly stressful symbols of flight, he moves onward toward the real thing.

The computer will help in the process by controlling a videodisk player that projects either stressful or calming images. The patient attaches a biofeedback device and begins the program. When the sensors indicate a high degree of stress, the computer immediately shifts the disk player to a tranquil scene. When the stress subsides, it returns the program to the subject of the phobia, perhaps at a slightly less fearful level.

computer games — up to 20 at a time can compete in a "space wars" game — or merely to "chat" with others by keying messages into a network set aside for that purpose. These computer klatches are similar to Citizen Band radio conversations, with the participants adopting handles and dropping into and out of a discussion at will. CompuServe, appropriately, has termed the feature "CB."

The computer's ability to assume a share of an individual's detail work — in his personal life and on the job — provides direct relief from stress. According to Freudenberger, neglect of day-to-day chores (bill-paying, trips to the cleaner) is both a symptom of burnout and an additional strain that deepens the victim's plight. Personal computers have helped a number of his patients get a grip on the loose ends of their lives. Using the machine for budgeting, checkbook balancing, scheduling and filing, imparts a healthy sense of organization to the frazzled stress victim.

"You have to tend your programs, keep everything on track," Freudenberger says. "And the computer gives you instant feedback, telling you just where you stand."

As in one's private life, the order a personal computer can bring to an office goes far in easing strain and promoting job satisfaction, even if the office's occupant is not in immediate danger of burning out. The machine's benefits on the job go far beyond the time and labor savings it provides.

"With the computer, you have to organize your universe and really understand the problems you're dealing with," says Charles Winter, assistant superintendent of the Mahopac, N.Y., school district. Winters recently put a TRS-80 Model III to work on student en-

rollment projections, cafeteria management, budget analysis and other office functions. A computer novice, he set up his programs with the help of VisiCalc, the financial-modeling software package.

"Building a computer simulation is kind of like making a voodoo doll," Winters says. "If you can reconstruct a problem, you get a sense of control over it — even if the mastery is largely an illusion."

Total control may be illusory, but the ability to analyze a problem much more fully by computer than by hand is real and provides very real advantages. The closer look increases your chances of finding the best course, and decreases the uncomfortable feeling that you may have overlooked it.

"Some of the projections we do — classroom needs, for example — are conceptually very simple," Winters says. "But it may take hours to work up a solution based on one set of data. By the time you're done, you don't have the time or inclination to go back and question your assumptions or try another solution. You feel as if you're putting in 10 hours a day just to survive — and that's stressful. When you don't have to spend hours crunching numbers, you can look at more possibilities. You come out with the awareness of having done a very complete job."

Someone just starting to use a computer on the job should give careful thought to the amount of time he wants to spend with it, Winters cautions; the machine's seductive qualities can infringe on office time.

"Mastering that machine is a lot of fun," he says, and adds that the programming experiments he's pursued for pleasure turned out to be valuable for business as well.

The portability of personal computers can also play a part in relieving the strain of high-pressure

occupations. People who have a hard time leaving work stresses on the job run a high risk of burnout, and for them, the possibility of carrying a large piece of the office home in a personal computer may seem like a danger.

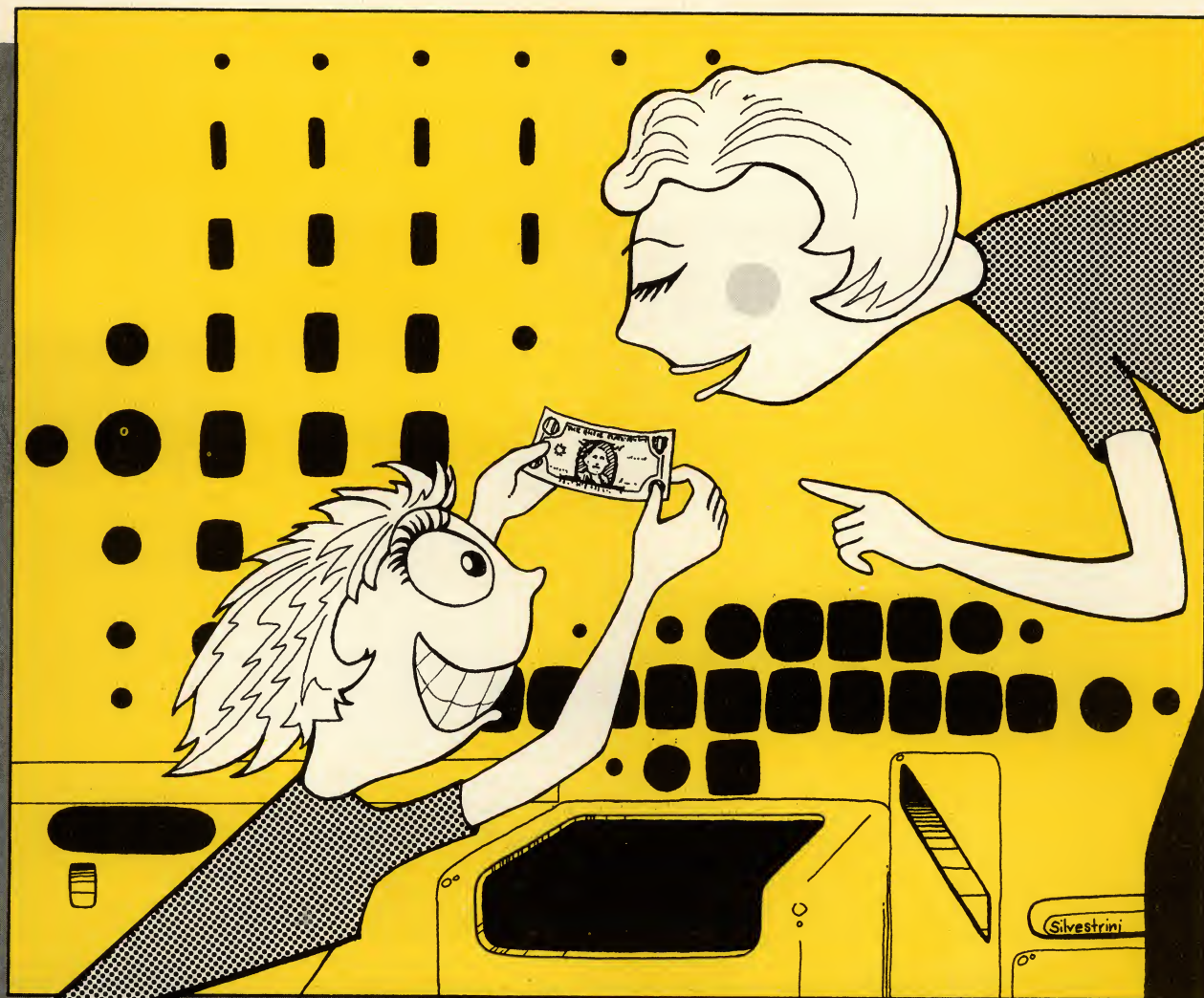
But Freudenberger sees it, instead, as a chance for the busy executive or professional to carve out more time with the family. One patient, an attorney, invariably has at least four hours of work every weekend requiring the help of a computer. In the past, that meant spending a good part of every Saturday at the office, or going there and back. Now he does his weekend work at home on a personal computer linked to the company's mainframe. And in the summer, he takes the computer to his beach house, wraps up his business early on Saturday morning, and has the rest of the time for relaxation. Since the man was unwilling to cut back on his workload, the home computer represented a healthy compromise: a few hours at the keyboard for a weekend at the beach.

David Kull, a journalist for 10 years, is management issues editor for Computer Decisions.

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"MY PERSONAL COMPUTER IS HAVING DREAMS ABOUT ARTOO DETOO!"



Gerry Silvestrini

THE DAY OF THE DOLLAR DISCOVERY

by Patricia H. Carro

Wednesday, January 8 started off like any ordinary day for the Greenback family. Herzog and Tifla Greenback sent little Cernu off to Discovery Camp, and settled at their workstations to tackle the day's business.

At 3 p.m., Herzog left for UniverSpa and Tifla faced the loathsome task of purging the perlintic. In the 20th Century, the task was known as "cleaning the attic" but, although the terminology had changed, the chore had not.

But, Tifla reflected, fair was fair. Herzog *was* in charge of food preparation each night. Perlintic purging was the least she could do.

The hoistlift transported Tifla to the perlintic in milliseconds. She carried a portable trash compactor in one hand, and an electrosweep in the other. Tifla set to work.

A buzzer sounded, indicating foyer entry and soon Cernu, the couple's 8-year-old daughter, had joined Tifla in the

dusty perlantic.

"Can I help, mommy?" Cernu asked. (In the 21st Century, physical labor is scarce and thus is prized. Children never have to be reminded to clean their rooms.)

"You can open this old steamer trunk for me, darling," Tifla said.

"The one that belonged to great-great-great-grandma Turner?"

"And to *her* grandmother before that, Cernu," Tifla reminded. "Now, let's see what I've got stored in here. We'll have to throw out things because perlantic space is so limited."

Cernu and her mother methodically sifted through the items in Grandma Turner's steamer. There were Ronald Reagan bumper stickers ("when cars *had* bumpers," her mother said) and Barbie dolls (still quite popular), copies of *People* magazine and an antiquated numbers machine ("they called them calculators," Tifla explained).

As Cernu lifted a voluminous copy of *Jaws*, a piece of thin, green paper fluttered to the floor. She bent to pick it up.

It was not something she had seen before. The shape was oblong, about the size of the piece of freeze-dried bread she had eaten for breakfast that morning. A man's face, which she recognized as belonging to George Washington, first president of the United States, stared back at her. The picture was faded and brittle to the touch, but it was him alright. The writing on the green paper said "One Dollar."

"What's this?" Cernu asked her mother.

Tifla looked closely at the item in her daughter's hand. Slowly, she said, "Why Cernu, I think it must be what they used to call a dollar bill ... cash ... money. It's what people used before the Enlightened Age."

"Really?" Cernu's hazel eyes were big as saucers. "What did they use the dollars for?"

"To buy things...and sell things. Whenever you needed to pay for something, you paid in cash. I suspect you'll learn about it in school later this year."

Cernu giggled. "Can we use it at the food purveyor's tonight?"

Tifla pondered the question. The family regularly dined out at AstroFriday's once a week. No, she decided, the food purveyor's would have no method for handling the dollar bill. But the question sparked another thought. It was time, Tifla resolved, for Cernu to learn the cold, hard facts about money. She would explain such a transaction in detail, when it took place at the food purveyor's.

AstroFriday's was, as usual, brimming with patrons. The Greenback family enjoyed a leisurely meal of soy-white, tofu and green wine. When the pauser came with their bill, Tifla told Cernu to check the amounts.

"Dad's meal is twenty-seven chords; mine is sixteen

chords and nine drals," Cernu told her mother, "and yours is twenty-one chords and seventeen drals." Cernu had learned all about the worldwide currency's electromonetary units when she was three years old.

"Excellent, Cernu. Now I'll let you pay for the meal." Tifla showed Cernu how to insert the magnetic card which displayed their bill into the tiny slot on their AstroFriday's tabletop. Next, she told Cernu the family's Purchase Code—a 23-digit number that had been assigned to the Greenback ancestors some one hundred years earlier. Cernu touched the miniscule keys next to the table slot.

"Now, Cernu, watch how the Community Comptroller checks to make sure that we haven't entered the wrong number." Quickly, Tifla placed her fingertips over the slot. They were laserscanned for identification.

"Your prints must match those on file with your identification number," Tifla explained to her daughter. "When you are responsible enough to handle a monetary transaction on your own—I believe the legal age is 21 now—your prints will be filed at the Community Comptroller."

Cernu digested this information. Then she asked, "Why did we dispose of cash...like the dollar bill I found?"

Tifla answered, "There were many reasons. In the latter half of the 20th century credit cards were introduced. I think this was because people were spending more than they earned. The credit cards allowed them to pretend they weren't overspending, at least for a while. Then in the early 21st century, when materials for clothing became scarce, someone had to devise a way to eliminate unnecessary materials, including the pockets where people used to carry their money and credit cards.

"This lack, plus advanced computerization, led to the eventual emergence of the numerical laserscan payment system we have now."

"How do you know how much you can spend?" Cernu wanted to know.

"Every day, we check our family account balance at our terminal," Tifla explained. "That gives us instantly updated financial information. There's also a warning system. If we didn't have the necessary funds to pay for our meal, for instance, the laserscan would have flashed red. Emergency funds would have covered us, but we would have had to make account adjustments when we returned home."

Cernu thought about what she had just learned. "Things have changed so much since the olden days," she commented.

"Yes...and no," replied her mother. "One of the most discouraging aspects remains: income tax. The Internal Revenue Service is still with us. That's why, each January,

Continued on pg. 47

A BREAK-THROUGH IN FACTFINDING: ONLINE WORLD BOOK

by Kathy Bissell

Ask for the moon. The stars. The universe. Find the source of the Amazon. Uncover the secrets of lost civilizations. All this and more is now yours with Online World Book.

Online World Book contains the full text of *The World Book Encyclopedia*. More than 32,000 subject entries lead you into an easy-to-use 10-million word encyclopedia that is updated four times a year.

Easy-to-use format

Here's a sample of how Online World Book works:

Select Online World Book from the CompuServe Information Services Menu, or enter GO WBE at any prompt. Then you'll see the Online World Book Menu which offers seven choices.

1. Online Encyclopedia
2. How to Use Online World Book
3. News Flashback
4. This Week in History
5. World Book Challenge
6. Product Information
7. World Book Talk-Back

To find an item in Online World Book press the number 1. Then, Online World Book videotex tells you how to search. Quite simply, you type in the word you want to find. World Book does the rest.

Let's sample EARTH. Type the word, take a deep breath, and voila! On the screen is a menu listing six articles for the topic EARTH. You can select from 1. Earth, 2. Earth Science, 3. Earthenware, 4. Earthquake, 5. Earthshine, and 6.



Earthworm. Each is numbered, and again, to simplify use, select the article you want by pushing the number.

Pick 4, Earthquake, and before your eyes, Online World Book will print the full text of the overview from the encyclopedia volume. You can stop at the end of any screen, if you have enough information. You can skim through the article to find the information at the end, which will include related topics. In this case there is a choice, again

numbered: 1. Why Earthquakes Occur, 2. Location of Earthquakes, 3. Prediction of Earthquakes, 4. Damage by Earthquakes, 5. Major Earthquakes and 6. Related articles.

Selecting 5 will reveal a listing of all major earthquakes recorded in history from the Corinth quake in 856 A.D. to the more recent 1980 tremor in Italy. You'd find, for example, that while California is known for earthquakes, Iran has had four major ones in the last two

decades: 1962, 1968, 1972 and again in 1978. Each one killed thousands of people. California, however, has had but one significant quake, in 1906.

Related articles on this particular topic range from the continental drift to seismology.

All search words can be accessed simply by typing in the single name. After that, related articles can be found either by name or topic number. Cross references and lists of related articles supply additional search terms and allow the user to "browse" through the encyclopedia. The search process is so streamlined that it means even those without sophisticated typing skills can operate the Online World Book and have good results.

The simplified search process developed for Online World Book may be a useful method for teaching youngsters how to retrieve information from computers.

While Online World Book has the full text of *The World Book*, there are important differences between the computer version and the print version. Each has its special use. "There are no graphics in Online. Graphics are an im-

portant part of *The World Book* to many users" says Bill Dobias, vice president for development at World Book.

But the electronic version has advantages of its own. "We started investigating the electronic media two years ago. Online retrieval, the ability to update and the capability to search with more ease than print, were all very important to us," Dobias says.

Two-way communication

Online World Book will also use the two-way communications capabilities of CompuServe. "We want to know how people feel about Online World Book. We want to know how they use the information base, what kinds of information they need, they use most often," Dobias says. We want to know if they are having any problems with use, too."

World Book also plans quizzes and contests using the two-way system; however, details are not spelled out at this time.

Readability a key

"Readability is one of the strongest features of both *The World Book Encyclopedia* and the On-

line World Book," according to Dobias. "It is written for specific grade levels," he says. "Certain articles are written with the needs of readers in mind. Certain ages tend to look up certain kinds of information. World Book has always been very readable."

FEEDBACK

The easy-to-read format makes research enjoyable for beginners, particularly at the elementary school level, but it is still factual enough for adults.

Here are some fabulous Online World Book facts discovered in our test run of online World Book.

1. How many major earthquakes have there been in this century?
2. Where was the legendary frontiersman and peace officer Wyatt Earp born?
3. How old is the field of electronics?
4. For what aeronautic feat is Amelia Earhart most known?
5. What is the Early Bird?

1. 21 2. Monmouth, Ill. 3. Less than 100 4. Flying Atlantic solo, first female. 5. Satellite.

Kathy Bissell is a free-lance writer and communications specialist from Columbus, and a frequent contributor to *TODAY* magazine

NEWS FLASHBACK AND WORLD BOOK CHALLENGE

Looking for background on current events? Touch number three, News Flashback, for the latest background information on people and places that are making the

news. Whether it's a debate in the U.N., a new sports record, or a question about a country, News Flashback will help you become more knowledgeable in current events.

If you're in the mood for a mental challenge, try *The World Book Challenge*, Quiz information that test real knowledge on a variety of subjects. Answers are provided along with information on where to look in Online World Book for information.

Vidtex™

**A powerful,
smart terminal
emulator program
compatible with
the CompuServe
Information Service.**

CompuServe's VIDTEX is a premium quality software program designed to expand the capabilities of your micro-computer by allowing you local control of a RAM capture buffer and error-free downloading and uploading of programs between your personal computer and our large, mainframe computers. VIDTEX is easy to use, and most features are performed through the meta key, requiring only one or two key-strokes. This software* is available for most personal computers and offers these outstanding features:

Full Printer Support. VIDTEX allows you to print a copy of your video screen or RAM buffer at any time and to simultaneously copy the characters to the printer.

RAM Buffer. The RAM buffer lets you capture all the characters received from the host into local memory and allows you to load from a disk file and transmit

to the host continuously or one line at a time.

CompuServe "B" Protocol. VIDTEX allows error free transfer from your disk to CompuServe as well as error free downloading of programs from our extensive software libraries, ACCESS and SOFTEX.

Function Keys. Ten user defined function keys are available to hold commonly used commands.

Auto-Logon. You can automatically log on to a host computer through a set of user defined prompts and responses or send predefined responses to host application programs after log on.

Standard Cursor Positioning. VIDTEX recognizes standard cursor control sequences from the host and allows the host to perform screen formatting on the microcomputer's video screen.

Graphics. A block graphics protocol allows CompuServe to transmit graphic and semi-graphic pictures such as stock charts and weather maps. (Not available for the Apple computer.)

CompuServe's VIDTEX software is available for most personal computers including the IBM PC, TRS-80 Model I/III, TRS-80 Model II, TRS-80 Color Computer, Atari 800, Apple II, Commodore PET and others.

VIDTEX software for the TRS-80 can be purchased in most Radio Shack Computer stores. To order VIDTEX for other computers, go to FEEDBACK on the CompuServe Information Service — GO CIS-4.

CompuServe

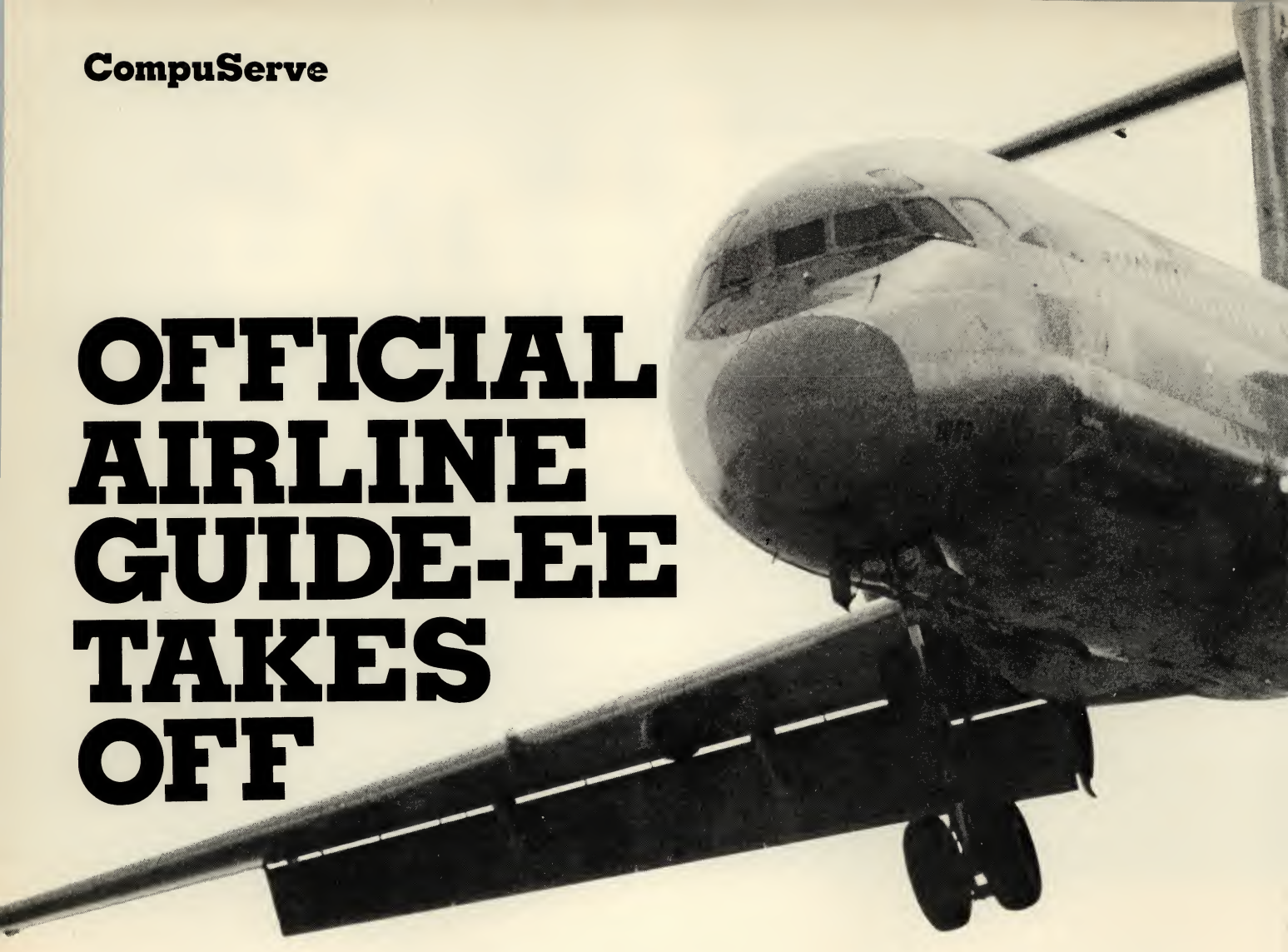
Distribution Center
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Columbus, Ohio 43228

800-848-8990
in Ohio call 614-457-8650

* Some versions of the VIDTEX software do not implement all of the stated features.

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OFFICIAL AIRLINE GUIDE-EE TAKES OFF



by Kathy Baird

Businessman Joe O'Reilly is planning another of his long weekend jaunts. He's been working on a project in Boston this week, but his heart's been in Colorado the entire time, and it's been hard for him to keep his mind on his work. Joe has decided to go to Denver to ski next weekend.

To plan his flight schedule, Joe checks his home computer. Since he's taking Friday off, he finds a dinner flight on Thursday that leaves Boston at 5:50 p.m. and arrives in Denver at 7:40 p.m. Joe

also finds a round trip fare that is less than half the regular coach fare.

A check of the return flight schedule Sunday reveals that Joe can be back in Boston around 5 p.m. He calls the airline to place his reservations.

Joe's experience is not a flight of fancy, but a reality, thanks to the Electronic Edition of the Official Airline Guide offered by CompuServe Information Service. The Official Airline Guide is a Dun & Bradstreet Company

The Official Airline Guide has taken several forms over the years. It originated about 50 years ago as a compilation in book form of the

printed schedules put out by airlines. About 25 years ago, it assumed a quick-reference format in which information about all carriers on a route was grouped together. Now, the OAG is being offered on-line for the first time.

"We list every direct flight for all carriers worldwide," explained Nancy Meyer, Project Director — New Business Development, for the Official Airline Guide.

"We found that there is a type of traveler who enjoys looking at schedule and fare information and making his own selection of flights and fares between the five or six—or even twenty—that are listed." OAG-EE is most likely to appeal to this type of traveler, who likes to have decided upon a flight number, date and time before calling the airline or a travel agent for a reservation.

dollars costs \$2.15. A five minute search at prime connect rates costs \$4.50.

"Our on-line surveys and market research said that travel and leisure are something that subscribers are very interested in," said George Minot, Senior Vice President of CompuServe. "We felt that schedule and fare information and ultimately making reservations would be the crux of that."

Sixty-five percent of those who subscribe to OAG in its printed form travel frequently for business; 20 percent are travel agents; and 15 percent are airlines. No figures are yet available on users of the computerized OAG, but they are expected to be primarily business travelers.

One user, our well-traveled businessman, Joe O'Reilly, has a big job in store for OAG-EE next weekend. He has meetings with clients in New York city next Thursday afternoon and the following Monday morning. On his three free days in between, he plans to make the most of his time by flying to London. With OAG's help, he's found a flight which leaves New York at 7 p.m. Thursday and arrives in London at 6:45 a.m. Friday. A return flight takes off Sunday at 4:30 p.m. London time and arrives in New York at 7:05 p.m.

With OAG-EE, Joe can have a good time in record time. Way to go, Joe!

North America is also available on OAG's Electronic Edition. A single flight will offer a choice of several fares, ranging from discount rates to coach and first class fares.

The cost savings realized by comparing these options may often be substantial. On the Los Angeles to New York route, for instance, when this article was written, round trip fares ranged from \$298 to \$970, depending on the carrier and the type of ticket purchased. "We know that people will save a lot of money using our service," Meyer said.

To keep OAG-EE current, more than 125,000 schedule changes are made each month and over 75,000 alterations in fare information are made each week. Direct flight fare information is updated daily, connection fares are updated weekly, and all schedules are updated weekly.

OAG-EE is a premium charged service. The standard connect charge is 43 cents per minute and prime time connect is 90 cents per minute. That means an average five minute search that could potentially save a user hundreds of

CompuServe subscribers may access the OAG Electronic Edition under main menu item Home Services, Leisure and Travel, and Business and Finance, Travel Services, or they may enter GO OAG at any menu page. By simply listing the departure city, the destination city, and the date and approximate time of flight, a traveler can compare information on scheduled direct flights and connections at a glance.

For each flight, OAG provides information on times of arrival and departure, airports used, the airline, type of aircraft, and whether a meal will be served en route. If the direct flights do not meet the traveler's needs, connections are provided.

"It's a very user-friendly system," Meyer said. "It's a system that anyone can use without experience with computers or airline schedules."

Fare information on all direct flights and connections within

MASTER

COMPUERVE "L" PROTOCOL

COMPUERVE "L" PROTOCOL

SLAVE

by James Davenport

Everyone knows how you can communicate with a modem: simply run a program in your microcomputer that makes it look like a terminal, call up another computer, and start communicating. This is fine for most telecommunications needs. However, on a noisy telephone line you may experience some occurrence of errors. These usually take the form of characters being completely lost, extra characters being randomly inserted, or characters being transformed to another character. This may not be too bothersome in normal timesharing because you can almost always figure out what was transmitted by looking at the resultant text. However, this could be disastrous if you are trying to receive a program over the communication line. If the program is source code, you may be able to discern the character that was garbled by examining the rest of the program. If the program is transmitted in hexadecimal or binary form, you may not even know an error occurred until you try to run the program and it doesn't work.

What is required for correct transmission of a program over a communication line is a protocol. A protocol is a set of rules that both the transmitting and the receiving computer agree to obey. A protocol may be referred to as a master-slave protocol. This means that one

computer is the master and initiates and maintains control of the protocol. The slave merely performs whatever the master wants done.

The CompuServe 'L' protocol is an example of a relatively simple master-slave protocol. The 'L' protocol is used for loading of machine code from the master computer directly into the memory of the slave computer. In this case the master computer is one of CompuServe's mainframe computers and the slave computer is a microcomputer. A machine language program may then be developed on CompuServe's mainframe computers using a cross assembler and then loaded into the microcomputer using the LODHEX program on CompuServe and a loader program on the microcomputer. The LODHEX program takes the object file output from a cross assembler and transmits it using the 'L' protocol.

Before attempting to use the 'L' protocol, LODHEX interrogates the microcomputer to see if it is running a loader program which supports the 'L' protocol. LODHEX does

this by transmitting the sequence <ESC><I> (1B,49 hex). If the microcomputer loader program supports the 'L' protocol, it responds by sending the sequence <L><CR> (4C,0D hex). If LODHEX does not receive a response in ten seconds or if it receives an unknown response, an error message is issued and no attempt is made to load the object file.

LODHEX then asks for the object file to be loaded. The name of the object file is entered (e.g. "TEST.OBJ"). The object file must be in Intel Hex, Kim, or Motorola format.

LODHEX then asks for an address offset. The load address of the object file is offset by the amount entered. This is useful when the object code to be loaded is located in the same address space that the loader program occupies. If it is loaded at the correct location, the loader will be destroyed while it is executing. If the object code is loaded with an offset, it can be loaded in the address space following the loader. After the load has been completed the object code can be relocated by a simple

<ESC> <L> <n> <lsb> <msb> <dl> . . . <dn> <cks>

The basic format of the CompuServe 'L' protocol block used to load machine code into a microcomputer's memory over telephone lines.

COMPUSERVE "L" PROTOCOL

COMPUSERVE "L" PROTOCOL

block move routine.

LODHEX then constructs and transmits an 'L' protocol block from the object file. The microcomputer loader program receives the block and calculates a checksum for the received block. If the checksum for the received block matches the checksum received, loader program responds with a `<.>` (2E hex). If the checksums do not match, the loader program responds with a `</>` (2F hex). If LODHEX receives a `</>`, it transmits the 'L' protocol block over again. If it receives a `<.>`, the next protocol block is constructed and transmitted.

The format of an 'L' protocol block is shown in the box on page 32. The `<ESC><L>` (1B,4C hex) indicates the start of a loader protocol block. The first field, `<n>`, is the number of bytes to be loaded; this value may be from one (1) to two hundred fifty-five (255). The next two fields, `<lsb><msb>`, are the starting address for the data in the form: least significant byte, most significant byte. In this form the address 89AB (hex) would be transmitted as `<AB><89>`. The next `n` fields, `<dl> ... <dn>`, are the actual data to be stored. The first value, `<dl>`, is stored at the address `<msb><lsb>`. The last data value, `<dn>`, is stored at the address `<msb><lsb> + n - 1`. The final value, `<cks>`, is the checksum.

If the value of any of the fields

from `<n>` to `<cks>` (inclusive) is less than 32 (20 hex), it is transmitted as `<DLE><n + 64>` (10,n + 40 hex). This is done to ensure that none of the values are transmitted as ASCII control characters. Note that since the data is transmitted one character per byte, all eight bits (including the parity bit) are significant. This requires that the UART be initialized to eight data bits with no parity.

The checksumming algorithm is performed on the actual values of the fields from `<n>` to `<dn>` (inclusive). The checksum is initialized to zero. For each value checksummed, the old checksum is rotated left one bit with bit 7 being rotated into bit 0; the new value is added; if carry occurs, one is added to the checksum.

There are two methods of processing the protocol block. Upon detection of the `<ESC><L>`, the count and address can be received. The data can then be stored in the correct location as it is received. This can be very dangerous since the address may have been received incorrectly and the data would be stored at an incorrect location possibly destroying valid data already received. The better method is to store all the values in a buffer and just checksum them as they are received. If the received checksum is correct, the entire block can be moved to the correct location and the `<.>`

sent.

Since nothing is displayed while the protocol blocks are received, the user cannot tell if anything is happening. This can be very annoying, especially if the object file takes several minutes to load. Hence, it is a good idea to give an indication of progress to the operator by displaying the response (`<.>` or `</>`) on the screen as well as transmitting it.

Some problems may still occur using this protocol. For instance, if a character is dropped, the mainframe computer will be waiting for a response from the microcomputer and the microcomputer will be waiting for the rest of the data from the mainframe computer. This can be corrected by putting a timer in the microcomputer loader program. During reception of a protocol block, if a character is not received in ten seconds, the microcomputer would send a `</>` causing the block to be transmitted again.

There is no best protocol for everyone, but the CompuServe 'L' protocol works well for loading machine language programs into a microcomputer's memory.

James Davenport is a software development supervisor at CompuServe Incorporated and a frequent contributor to TODAY magazine.

THE RETAILING BOOM IN SMALL COMPUTERS

Unlikely merchants, ranging from supermarkets to rental outfits are entering the fray

Last August, Jody Black was down on his luck, an unemployed pilot for Braniff International Corp. Today he sells the TI 99/4A home computer door to door, or, as he prefers to describe it, "friend to friend," heading a company he calls "the computer industry's version of Amway or Mary Kay Cosmetics."

Black is among hundreds of eager beavers banking their future on selling home computers to public that has, in one year, demonstrated its hunger for the little machines. In September, 1981, the entire personal computer industry was described as "distribution limited" by Portia Isaacson, president of Future Computing Inc., a Richardson (Tex.) consulting firm. Only a few department stores had expressed interest in home computers, and mass merchandiser catalog sales of the machines were dismal. Analysts, retailers, and manufacturers themselves agreed that the big market was at least two or three years away. Few anticipated the explosion in demand that has seen worldwide sales of home computers grow from 300,000 units in 1980 to an expected 1.5 million this year or that the number of stores selling them would approach 13,000.

Many markets.

Home computers, which sell for less than \$1,000 and are used

chiefly for game-playing, family finances, and teaching, are without question the fastest-growing segment of the desk-top computer market. To appeal to that segment, Hewlett-Packard Co. recently introduced a portable computer called the HP-75, to be sold for \$995. The high-end machines — those costing from \$5,000 to \$15,000, which perform sophisticated business functions — are also selling well but to a different market: the business community. "The two best-selling segments are the low end and the high end," says Egil Juliussen, a partner in Future Computing. Moreover, he says, there is a growing market for medium-price computers.

Like other consumer products, those selling the best have either a strong brand name or an attractive price. For instance, in the home-use area, consumers have indicated that their interest rises sharply as prices dip below the \$500 mark, and manufacturers and retailers are hustling to sell machines in the \$200 to \$300 range. Such prices have led a host of unlikely merchants to try to mine this segment. In Seattle, Safeway Stores Inc., the nation's largest supermarket chain, is testing Commodore International Ltd.'s VIC 20, priced at \$199.95, in 12 of its largest stores. According to Don Maloney, variety merchandise buyer at Safeway, the test in Seattle has been so successful that the stores may stock another line.

Other retailers trying to get in on the sales boom include audio and video houses, department and discount stores, and even television rental operations. Newington (Conn.)-based Rentacolor USA Inc., which operates 38 outlets, will test renting the Commodore VIC 20 for less than \$30 a month.

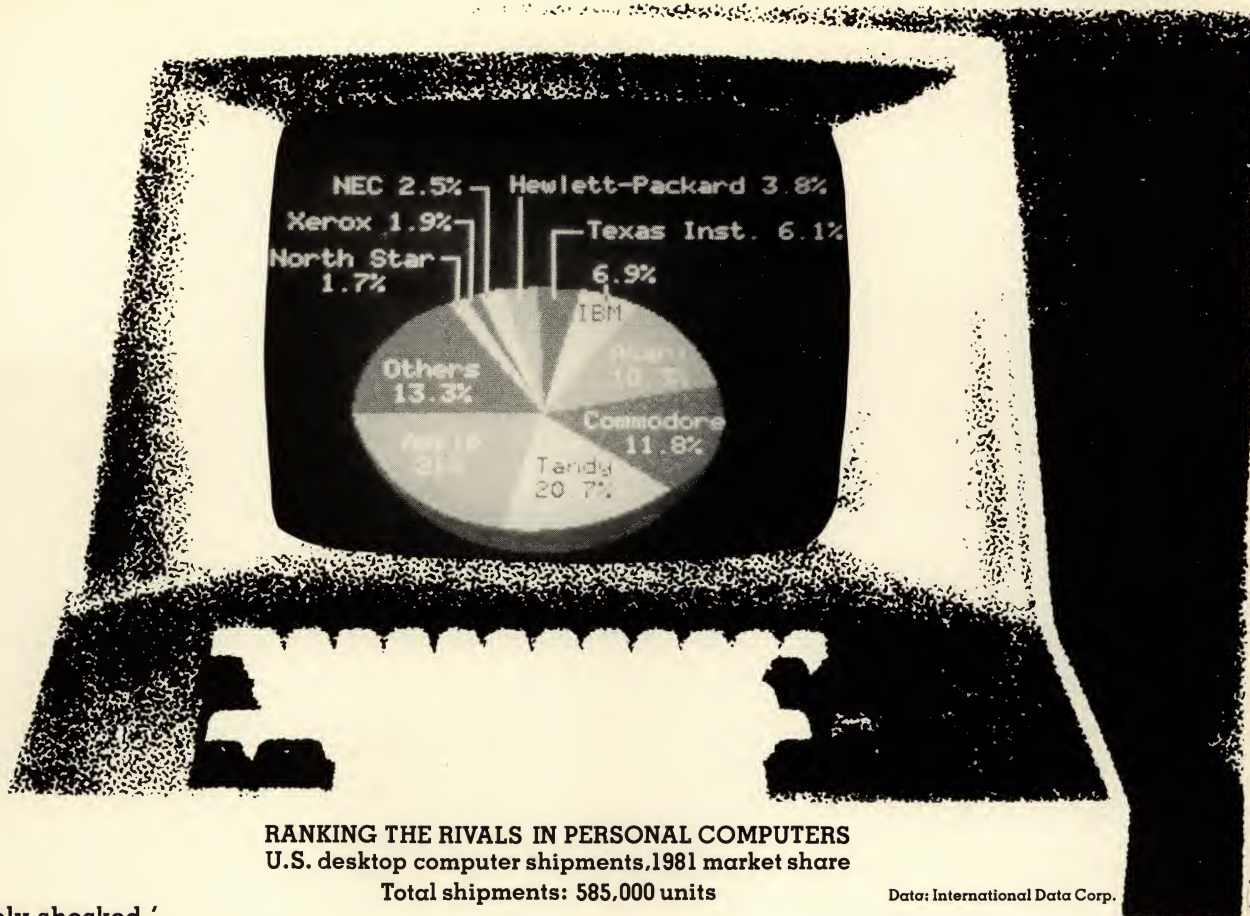
The sales frenzy.

To a large degree, youngsters are the driving force behind the movement in home computers, since the videogame craze boosted the computer to the status of a super-sophisticated toy. The current sales frenzy is expected to reach fever pitch as the all-important holiday season approaches. In the rush to grab market share, some of the biggest names in home computers — Atari, Tandy, Commodore, and Texas Instruments — are battling for shelf space and sale, using price as the weapon.

For instance, in 1980, when Texas Instruments Inc. introduced its home computer, the 99/4, its retail price was about \$1,000. Now an updated version of the same machine, the 99/4A that Jody Black is peddling, costs \$199. Tandy Corp. started cutting prices in June, when it shaved \$100 off its suggested retail price for the Color Computer, bringing it to \$299. Commodore took \$25 to \$40 off its wholesale price on the popular VIC 20 in August, and some retailers offer it for just under \$200.

At these prices, the high-end videogames, such as those marketed by Mattel Inc. and Atari, could be threatened. Says William J. Turner, vice-president for computer products at Texas Instruments: "We think 10 percent of the current installed videogame base (12 million families) will upgrade to a home computer this year."

Mass merchandisers, department stores, and specialty chains such as Toys R Us see themselves as the big winners in the price war. K mart is carrying Texas Instruments' 99/4A and Commodore's VIC-20 in about 600 stores nationwide. Sears, Roebuck & Co., Woolco, and Montgomery Ward are rushing home computers into their stores.



'Absolutely shocked.'

As the prices of the machines drop and as they become easier to use, direct-mail sales will pick up significantly. Juliussen at Future Computing reasons that buying a computer by mail works for the home market because the buyer knows how he will be using it and does not need training. Last May, American Express Co. offered Sinclair Research Ltd.'s ZX-81 at \$99.95 to those of its credit-card customers who have previously bought educational or electronic items by mail. Sandra W. Meyer, president of the Communications Division at American Express, says the company thought it might sell 25,000 units. It sold that many in the first three weeks, primarily to families with children, and it will probably sell 75,000 units this year. "We were absolutely shocked," says Meyer. "Many manufacturers told us it wasn't possible to sell computers through direct mail. They felt they needed more service and explanation than we could provide. But we thought if we explained the machine well

enough, had a hardy computer, and pointed out its uses, we would find an audience."

The Sinclair machine is also being offered in retail outlets through a deal with Timex Corp. Last February, Timex, which manufactures the machine in Britain, signed an agreement to become the exclusive marketer of the ZX-81 in the U.S. At a certain level of Timex sales in the U.S., Sinclair has agreed to close down the direct-mail operation. "You cannot satisfy any market as big as the U.S. by mail order alone," says Clive Sinclair, managing director.

Critical years.

Texas Instruments' Turner says his company's research shows that the sale of the first home computer on the block will spawn six more computer sales in short order, five of which will be the same brand as the first. He estimates that \$10 million was spent last year to advertise home computers, most of it aimed at Christmas sales. "This year there will be no less than \$100

million and maybe \$130 million spent," he says, adding that "1982 and 1983 will be critical market-share years for manufacturers. History won't matter much."

The rapid expansion of the home market is having profound effects on manufacturers' strategies. Frederick A. Snow, president of Vector Graphics Inc. in Thousand Oaks, Calif., describes a "dichotomy taking place" in the desktop computer market. With the proliferation of new machines, Snow says, manufacturers are having to decide whether to go after the home market or the business customer. He says makers of computers for hobbyists—or home users—will offer low prices and easily available software. Manufacturers of the more expensive business-oriented computers will concentrate, as Vector has, on recruiting dealers who can tailor software packages for customers and provide training and assistance in answering questions. He believes that computer makers covering the entire market spec-

Industry Watch

trum are headed for trouble.

Getting squeezed.

Further, the growth of the home market has been a problem for some computer specialty retailers who have seen that market move away from them and toward general-merchandise stores. ComputerLand Corp., which operates more than 290 franchise units across the country and commands a huge share of the retail market, is starting to feel the effects of the stratification. "It's been a question for us from the beginning as to how long we could continue to be the computer store for everybody," says Donald D. McConnell, vice-president for marketing. Although 80 percent of ComputerLand's sales are to the business and professional market, McConnell says the company is trying to position itself to take advantage of whichever way the market swings.

Within the industry, ComputerLand is often referred to as a computer supermarket for hobbyists. That image caused Apple Computer Inc. and Vector Graphics to pull their computers out of some ComputerLand stores. Lack of business-customer service and training was a key issue, says Vector Graphics' Snow. One retailer says that ComputerLand and similar "supermarkets" are getting squeezed by the mass merchandiser at one end and the business specialist stores at the other.

Many computer retailers, conceding the home markets to the mass merchandisers, are taking aim at specific users, such as doctors, lawyers, and accountants. Some are employing an outside sales force to tap the lucrative market offered by large corporations that use the small-business computer as a managerial tool. Such retailers emphasize brand name and service. In fact, part of

the success of the Sears Business Systems Center stores — five of which opened last fall — has been a heavy reliance on selling service as well as machines. Currently the stores carry only three brands of computers: IBM, NEC, and Vector. But they clearly appeal to business customers by offering highly trained sales personnel and service. Sears plans a strong retail expansion, hoping to have 50 stores operating by the end of this year.

Brand-name allure.

For retailers to stand out from the crowd, they will have to offer special services, says Joel Schwartz, vice-president of Digital Equipment Corp.'s professional computer group. He finds that most retailers are familiar with word processing or financial analysis functions, but thinks that in the future they will have to tailor software packages to fill specific needs. Retailers will specialize, for example, in software for dentists or farmers and sell the units best suited to those purposes.

Concentration on the business user has been a key element in the success of the IBM Product Centers. IBM already has 18 such units and will move aggressively to open more. The strong brand name coupled with a wide distribution net has analysts predicting IBM will sell 180,000 of its Personal Computers in 1982, if the company can make that many. "Brand-name recognition is becoming extremely important," says Juliussen at Future Computing. "Both Apple and IBM are doing better than anyone else. They have good name recognition, and they are going to keep it."

But brand name alone is not enough, he adds. For example, Xerox Corp., which has been positioned at the upper end of the personal market, has had its share

of problems. Xerox machines have little to distinguish them from the rest of the market and need a technological edge, says an industry observer. Robert J. Ruebel, senior vice-president of Dallas-based Xerox Office Products Div., says the market is slow in finding "its definition" and that Xerox's direct-sales force, which is accustomed to selling copiers, "is taking its customary amount of time to grab hold of a new market. A personal computer is different from what they have been selling."

Service is key.

In an increasingly crowded environment, even Tandy, which has the advantage of a huge distribution system already in place through its Radio Shack stores, may face some rough times as it straddles the fence between manufacturer and retailer. Company executives feel that even at the low end of the price spectrum, however, service is paramount. Ronald G. Stegall, vice-president for computer marketing at Tandy, says "We found out quickly that the man who gives us five days to fix his clock radio is a different person when his word processor goes down."

That kind of reliance on desktop machines, both at home and at work, affects most computer users. It also prompts a wide range of glowing projections from market researchers. John Gantz, vice-president of International Data Corp. is forecasting 2.8 million unit sales annually in the U.S. by 1985, while Clive C. Smith, an analyst at the Yankee Group, sees sales as high as 8.8 million units — of which 6.5 million will be home computers — for that same period.

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C O N U N D R U M

by Mary Vaughn

JUMBLE

Rearrange each set of scrambled letters to form a simple word. Using the boxed letters from each word, answer the jumble question.

- | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. HARPETY | — | — | ■ | ■ | — | — | ■ | | | | | |
| 2. CHESTDOMEATA | — | — | ■ | — | — | — | ■ | — | — | — | ■ | — |
| 3. ZEALI | — | — | ■ | — | ■ | — | — | — | — | — | — | — |
| 4. STREAM | ■ | ■ | — | — | — | — | — | — | — | — | — | — |
| 5. LOCOPORT | — | ■ | ■ | — | — | — | — | ■ | — | — | — | — |
| 6. WRITEEVIN | — | — | ■ | — | ■ | — | ■ | — | — | — | — | — |
| 7. MONCAMSD | — | — | ■ | ■ | — | ■ | — | — | — | — | — | — |
| 8. PAYCIR | ■ | — | ■ | — | — | — | — | — | — | — | — | — |
| 9. STEAPNT | — | ■ | — | — | ■ | — | ■ | — | — | — | — | — |
| 10. BASHPOI | ■ | — | — | — | ■ | — | ■ | — | — | — | — | — |
| 11. GLYCHOOSPY | — | — | ■ | — | — | ■ | — | ■ | — | — | — | — |

Now arrange the letters contained within the squares to form the solution.



Clue: What the cracked computer diagnosed as the potty programmer's problem.

Answer: Manic _____, loss of _____, and acute
_____.

See page 48 for solution

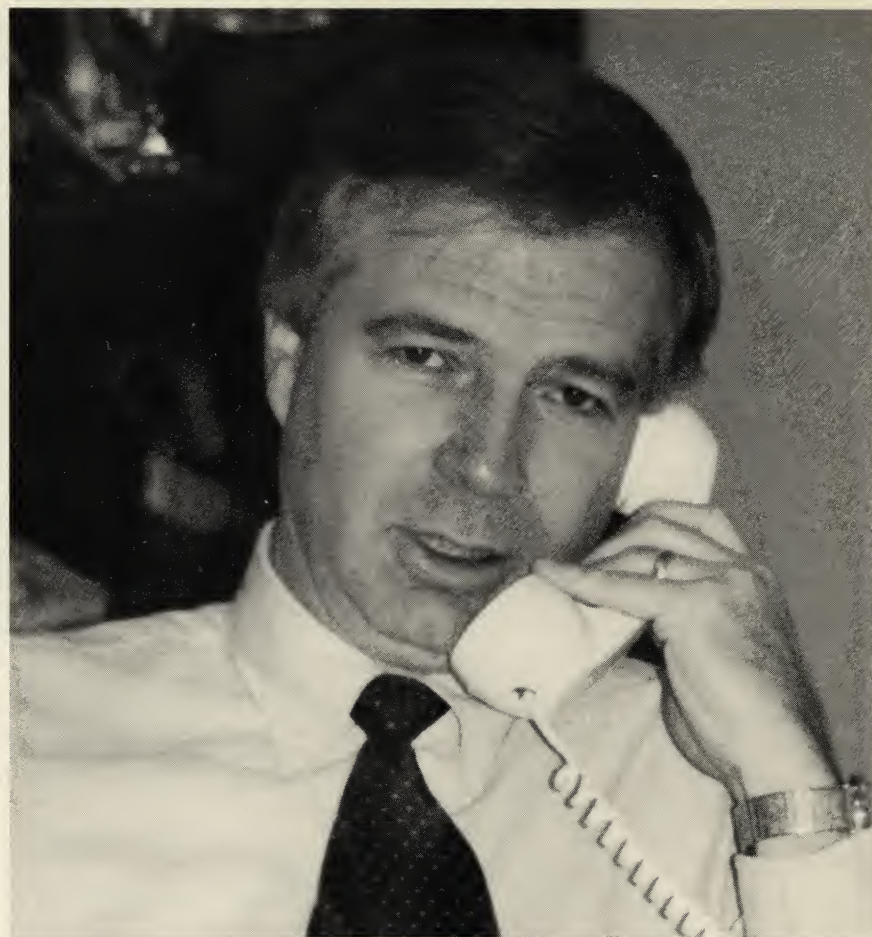
BOUNCE BACK: ADVERTISING ENTERS THE INFORMATION AGE

Everyone is familiar with reader service cards. When you want more information on a particular product or service, you circle the little number pertaining to the magazine ad that aroused your interest, mail the card — then 4 to 6 weeks later receive information from the advertiser that you already forgot you requested.

Not so with TODAY readers and advertisers. "Electronic Bounce Back is our electronic version of the old fashioned reader service card," TODAY publisher Cal Hamrick explains, "and it offers distinct advantages to both the reader and the advertiser."

Bounce Back gives the reader the advantages of speed, convenience and economy. By requesting information through Electronic Bounce Back on a personal computer or terminal, the reader can type in a name, address and any other pertinent information—and that information is immediately received by the advertiser. The reader can even leave a special note or message along with his request for information.

The advertiser can respond immediately while the potential customer is actively interested in the product or service, and can positively affect the customer's decision to buy. The advertiser has the option of responding electronically and can answer specific questions through Electronic Mail (Email™) directly to the individual. Also, since the reader himself is entering data requested by the



John Lesco

TODAY publisher Calvin Hamrick: Bounce Back offers advantages to readers and advertisers.

advertiser, there is less chance of incorrect address information being recorded.

To use Electronic Bounce Back, readers of TODAY magazine need only follow simple prompts appearing on the computer or terminal screen. Each issue of TODAY will offer complete instructions for user inquiries.

Hamrick says customers can use Bounce Back for less than the cost of a 20-cent stamp. In testing the system, he found a typical information request took about two minutes. With charge time of 8½ cents per minute, total cost is slightly less than 17 cents per order.

The idea for Bounce Back came out of discussions with TODAY sales representatives looking for methods to offer expanded services to advertisers. Since most TODAY advertisers are involved with the videotex industry, many already possess the necessary hardware for handling electronic

inquiries. Hamrick suggests that advertisers may even want to tailor their ads to customers' electronic responses and points out that Electronic Bounce Back can be used as a mechanism for gathering marketing information from customers.

The Bounce Back system has been evaluated, tested and is ready for use in this issue of TODAY.

Hamrick says he expects the system to be enhanced over time to offer even wider services. "I would hope that someday we'd be able to offer the service of processing orders electronically," he speculates. "The reader could simply order a product or service on his own computer or terminal, charge it to a credit card number, and everything would be taken care of electronically. We're not there yet, but it's certainly well within our technical capabilities."

Electronic Bounce Back

Instructions/Tips

STEP 1. Enter Electronic Bounce Back through User Information item #11 or Go EBB-1. Once you are familiar with this service you may wish to save time and skip the introductory pages by going directly to EBB-4 (Go EBB-4).

STEP 2. At the EBB menu, select either item #1 to receive an index of advertisers or item #2 to go directly to the ordering section.

STEP 3a. Selection of item #1 will display a list of issue dates from which to choose.

— Once you have identified an issue date, you will be presented with an alphabetic listing of advertisers unique to that issue.

— you may wish to review the entire list of advertisers or you can interrupt the list by typing Go EBB-4 at the end of any page. This "Go" command will return you to the information ordering page.

STEP 3b. Selection of item #2, on page EBB-4 (step 2) will prompt as follows:

Enter Advertiser(s) names(s)

>

If requesting information from more than one advertiser, separate their names with commas, i.e. Company A, Company B. By doing so, you will not have to reenter your name and address for multiple advertisers. **NOTE: Be sure to enter advertisers' names, NOT product names.**

Enter month in which ad(s) appear

>

Enter your name

>

Enter your street address

>

Enter your zip code

>

Enter comments or questions up to a maximum of 3 lines of 132 characters per line

>

>

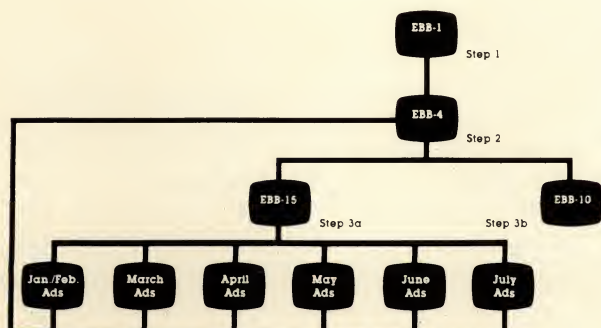
>

This is your opportunity to specify the nature of your inquiry. Keep in mind you will be communicating directly to the advertiser and not to TODAY magazine or an independent clearing house.

If you do not wish to enter a special message, simply key (ENTER) at each of the three > prompts.

NOTE: These comments will be received by all advertisers listed above. To make specific comments unique to multiple advertisers, simply repeat Step 3b.

After completing your request, you are returned to Step 2.



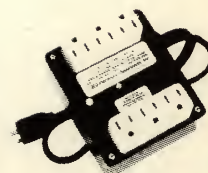
**DISK DRIVE WOES?
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ISO-1

Don't Blame The Software!

ISO-2



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- ISOLATOR (ISO-2) 2 filter isolated 3-prong socket banks; (6 sockets total); integral Spike/Surge Suppression; 1875 W Max load, 1 KW either bank \$76.95
- SUPER ISOLATOR (ISO-3) similar to ISO-1 except double isolation & Suppression \$115.95
- SUPER ISOLATOR (ISO-11) similar to ISO-2 except double isolation & Suppression \$115.95
- MAGNUM ISOLATOR (ISO-17) 4 Quad isolated sockets; For ULTRA-SENSITIVE Systems \$200.95
- CIRCUIT BREAKER, any model (Add-CB) Add \$10.00
- REMOTE SWITCH, any model (Add-RS) Add \$18.00

AT YOUR DEALERS

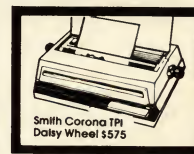
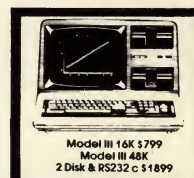
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Model III 4K LEV1	599	R.S. Modem II D.C.	210	Tandon 40 Track MI	289
MODEL III 16K	799	Signalman Modem	89	Color Computer Drive I	
MODEL III 48K	864	Daisy Wheel II	1715	Color Computer Drive 0	
Model III 48K		DWP-410	1335	Primary Hard Disk Mill	3899
2 Disk & RS232 c	1899	Smith Corona TPI DaisyWheel	575	Primary Hard Disk Mill	1999
Color Computer 16K	235	Epson MX80	499	ETC.	
Color Computer 16K		Epson MX80 FT	549	CCR-81 recorder	52
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EASY WRITER CLEANS UP ITS ACT

Reviewed by William Joseph

The only serious blemish on the otherwise sparkling debut of the IBM Personal Computer was the original version of the EasyWriter word processing program. It wasn't long before EasyWriter was being described as "anything but."

Venerable old IBM, however, is one company not accustomed to the sting of that sort of criticism. The new EasyWriter Version 1.10 is evidence of their determination to rid themselves of the egg on their face. It's good, darn good.

In version 1.00, the insert/delete functions were painfully slow, the block move/copy function was awkward, and the imbedded print commands caused extra line feeds that sometimes fouled up the formatting routine. Those and a number of other functions have been noticeably improved in the new version.

One of the most valuable improvements was in the documentation. The new manual is fat and sassy; with an easy-to-follow tutorial up front, a reference and clear explanation of commands and menus in the middle, and appendices filled with such goodies as tips for advanced users and troubleshooting hints. An hour or so with this manual should allow any user already familiar with a typewriter keyboard to have the program up and running with the basic word processing functions. (The exotic stuff, of course, requires some study time.)

When you first boot up EasyWriter, you are in the File System, one of the three command levels.

The other two are the Additional Commands menu and the Help Menu. All can be called up with a single keystroke, and the Help Menu can be left on the screen while editing, a dandy feature during the learning period. The information on all menus is complete and largely self-explanatory.

Creating a new document starts from the File System, and it's a snap. Just hit "E" (for editor) and you have a nice blank screen ready for your deathless prose. Calling up an existing document for revision or printing is equally as easy. The "save" and "revise" functions require only a single keystroke plus "Y" in response to the sober admonition, "Are you sure?" (Of course, the "save" and "get" functions require that you type in the name of your document.)

The text alignment function seems a bit faster in the new version (though still on the slow side), and text can be aligned with or without right justification.

The block move and block copy routines have been thoroughly overhauled and now require only that you insert a block marker (with F-8) at the beginning and ending of the block to be moved or copied; delete the block with Ctrl-C; move the cursor to the new location and insert the block with Ctrl-G. This routine, as well as most of the others, makes good use of the PC's special function keys.

Of course, EasyWriter is not without its shortcomings. Many of the functions are still too slow when compared to some of the competition. The page-up and page-down scrolls, for example, take about three seconds when full pages are involved. The search and replace function works beautifully, but it too is slower than some may like.

Another criticism of the new

EasyWriter is the limited file (document) size. Unlike some programs that move text back and forth between RAM and disk as needed, EasyWriter stores the entire file in RAM, thus the limitations on file size (14,000 bytes with 64K memory, 24,000 with 128K). In actual practice, though, this whole issue seems rather academic. EasyWriter has made it easy to "link" up to 124 existing files on the same disk, and print them as if they were one; thus, the theoretical file size limit is not restrictive.

With all of its improvements, though, EasyWriter is not yet a match for WordStar, the program from MicroPro International that some consider to be the standard against which other micro word processors are measured. WordStar is considerably more powerful. That is, it can do a lot of the exotic word processing functions not available on EasyWriter.

Considering the differences in list prices, though, (about \$495 for WordStar vs \$175 for EasyWriter) and the much greater time and effort needed to master the complex command structure of WordStar, the EasyWriter package stacks up as a solid citizen in our growing software population.

Word processor users who do not require the ultimate in speed and elegance will find EasyWriter Version 1.10 to be a dependable, easy-to-use program well worth its modest price.

William Joseph is a free-lance writer from Philadelphia. Joseph has been writing for 20 years and his works have appeared in many magazines including Consumer's Digest, Popular Electronics and Changing Times.



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"ALCHEMISTS" PROVIDES STIRRING LOOK INTO COMPUTER INDUSTRY

**THE NEW ALCHEMISTS:
Silicon Valley and the
Microelectronics Revolution.**

by Dirk Hanson,
Little, Brown & Co., Boston, Mass.,
364 pp. \$15.95.

Reviewed by Charles Bowen
and J. Stewart Schneider

When it comes to understanding this year's innovations in microelectronics, many of us know the feeling of being left behind. Let's face it—we've been lost since the beginning. That a slab of silicon can be transformed into a storage bin for information is just so much magic.

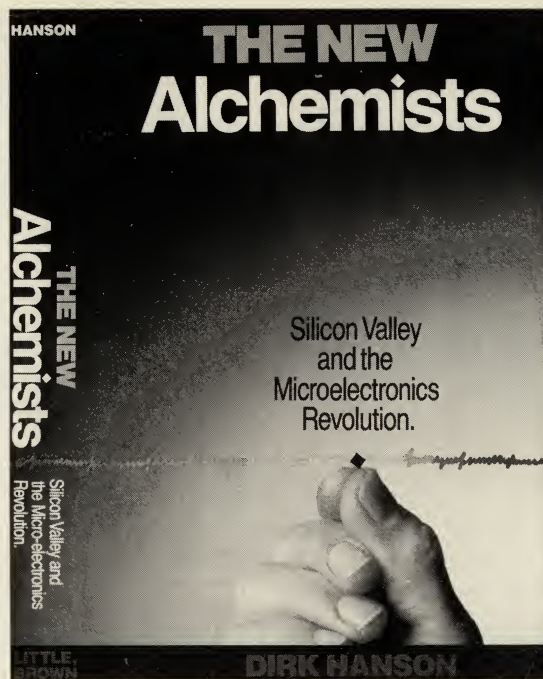
And this year's improvements on last year's discoveries leave us awed, but unenlightened.

We need an historical perspective. More than that, we need a guide—a patient storyteller with the insights of an industry insider and the inclinations of a Theo White or a John McPhee.

Others have tried. In the decade and a half since we discovered that silicon x imagination = microprocessor, hundreds of books have been published and magazines started to try to give us a glimpse of the wonders to behold in the caldrons of these new alchemists.

But, Lord love them, for all their enthusiasm, many of these earliest writers have been so enthralled with the processes that they've nearly rendered the human beings right out of the chronicle, leaving us with an antiseptic landscape, seemingly untouched by human hand or mind.

If you were going to write the



Dirk Hanson's "The New Alchemists:"
Tales of Edison,
Tesla and Babbage

history of the microelectronics industry, where would you start? Hanson starts his story with Thomas Edison and his obsessive competition with Nikola Tesla in the investigations of electrical current before the turn of the century.

In Edison and Tesla's feud over AC/DC current, we see the conflict of two scientific cultures.

Tesla was reared in the European tradition of pure scientific research in which inventions were no more than models to demonstrate discoveries. In 1905, he had a dream of a worldwide communications network conveyed by electricity, and, while it was his vision that created Westinghouse Corp., Tesla died penniless in a New York hotel.

Meanwhile, Edison carved out a new role of the inventor as part scientist/part merchant. He was always watchful for the potential profit of an invention and once felt so threatened by Tesla's discoveries in AC current that he had his assistants actually publicly electrocute stray dogs to demonstrate that AC was too dangerous. Edison so wanted to discredit Tesla that he finally said AC was dangerous enough to replace hanging as a means of public execution, adding that the term should be "Westinghousing."

Hanson takes the time to show us this bitter controversy because he wants us to see that, to a large extent, the microelectronics industry is the product of the stormy marriage of two scientific traditions. Keeping that in mind will help us better appreciate some of the people Hanson will introduce us to.

- Like Charles Babbage, the irascible 19th Century British engineer whose design of the earliest automated calculating machines—the Difference Engine and the grander Analytical Engine—collapsed under the weight of their steam-powered cranks, gears, pulleys and levers, but whose theories sparked imagination for more than 150 years.

- Like American Lee DeForest whose turn of the century improvements on Edison's light bulb yielded the triode, or three element vacuum tube which could be used to amplify electrical signals. DeForest saw his invention come into use, but it was so successful it was gobbled up by the already formidable AT&T.

- Like the awesomely brilliant young theorist Alan Turing who described in a scholarly paper in the 1930s a universal computing machine that could use a system of binary information storage, then

turned those thoughts to actions during World War II on the COLOSSUS project to help break the German code.

But all that's ancient history, all part of the groundwork necessary to understand the post-war explosion in electronics.

If there's a flaw in Hanson's work, it's in the last quarter of the book. Here he endeavors to bring us up to date on many of the various branches of microelectronics, including telecommunication, the status of the AT&T court fights, personal computers, automation and computers and defense. In doing so, he abandons the mini-biographies that make the bulk of the book so enjoyable.

Of course, part of the problem with trying to chronicle these recent years is the nature of the beast itself. As Hanson points out, Edison's primary legacy to microelectronics is the concept of the research laboratory and in the rapid years between 1975 and the present, it is harder and harder to point to individual discoveries. More and more, they are the product of laboratories, not individuals.

And this acceleration is the author's other obstacle. For example, major new developments in the AT&T case during the summer made a small section of the book dated before it even hit the stands.

But these are blemishes, not fatal errors.

Because of Hanson's readable, journalistic style, it is probably inevitable that his book will be compared to Little, Brown's recent Pulitzer Prize winner, Tracy Kidder's "Soul of the New Machine." It would be a shame if Hanson's fine book were lost in Kidder's shadow, because it is a stirring, important book for anyone who wants a perspective on the computer industry.

THE 68000: PRINCIPLES AND PROGRAMMING

By Leo J. Scanlon

\$14.95 238 pages.

Published by

Howard Sams & Co., Inc.

**Reviewed by Dan Keen and
Dave Dischert**

For those readers who are fortunate enough to have purchased one of Radio Shack's new Model 16 computers, you may recall seeing this book recommended in the Model 16 editor/assembler manual.

There are several books on the market that deal with this latest microprocessing chip, but this is by far the best one we have read.

The material here is presented in a logical fashion, dealing first with some background on the MC68000 integrated circuit. It then progresses through programming and on into external hardware.

Assembly language programming for this device is handled in an easy to read and very tutorial manner. The author's frequent use of diagrams and short assembly listings help to clarify concepts developed in the text.

The book does, however, assume that the reader has some knowledge of assembly language programming, regardless of which type of microprocessor he has worked with.

The inclusion of interesting facts about microprocessors in general as well as the 68000 gives this somewhat dry technical subject a light and easily readable format. The author writes "...whereas early microprocessors contained from 5000 to 10,000 transistors on a chip, today's processors contain up to 110,000 transistors!"

Among the book's eight chapters are discussions of handling math problems and creating look-up tables in assembly language.

The appendix consists of the ASCII character set (7-bit code), a list of execution times for various instructions, decimal/hexadecimal conversion charts, and naturally the 68000 instruction set.

There are a few minor differences between the editor/assembler discussed in the book (which is by Motorola), and the editor/assembler supplied by Radio Shack with the Model 16. For instance, the mnemonic MOVE in the book is MOV on Shack's version. This poses no problem, but it does require a programmer who uses this book to learn to program for that particular computer to check the op codes and syntax supplied with his owner's manual.

Armed with this book and the Model 16 manuals, you can enter this new era of 16 bit processor programming. And since there is almost no software available yet for the Model 16, this is an open field for anyone who wants to develop programs utilizing the MC68000 integrated circuit.

The 68000:Principles is a tool you will be glad you bought.





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Industry Watch

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Discovery

Continued from pg. 26

we communicate with our financial advisor on our ter-
minals, to evaluate our funds position."

Tifla snapped her fingers as a thought occurred to her.
"I wonder whether we'll have to report Grandma Turner's
dollar bill as new income? It certainly isn't transferrable
or useful in any way ..."

Cernu interrupted her. "You said people used to pay
the food purveyor's bill with cash. What else did they do
with it?"

"Oh...lots of things," said Tifla. She searched her memory
for tales handed down through the generations. "People
used to gamble with it, for one thing. They would cash
their paychecks and spend it all, betting at the racetrack
on horses with names like Secretariat and Alydar.

Our wagering has become much more civilized in the
Enlightened Age, you know. The Community Comptroller
allows just a minimum percentage of our funds to be
released for stock market purposes. And it's much more
daring than betting the horses!"

"What are horses?" Cernu asked.

"They had four legs ... oh, I'll explain later. I keep for-
getting there's so much about ancient civilization you don't
know!"

"What else did people do with their cash?" Cernu asked.

"Another custom was tipping," Tifla explained. "Es-
pecially in a large metropolis like New York City, you al-
ways had to have quarters and dollar bills handy to give
to cab drivers, doormen, waiters—we call them pausers
now—maids, hairdressers, *everybody*. That's one cus-
tom that couldn't die soon enough.

"Then there was the controversy over video games.
Parents had to keep an endless supply of quarters on
hand so their children could go to video arcades and play
PacMan and Asteroids and Donkey Kong and ... well, you
get the idea. They were very primitive games, Cernu, not
nearly as fun as the ones you play nowadays."

Cernu nodded in agreement; she had read about the
PacMan Invasion on her history teletext.

On the way home from AstroFriday's, Cernu tried to
remember all the details about cash that her mother had
told her. She also tried hard to ignore the discomfort in
her mouth. Her little tooth had become increasingly loose;
was it the soywhite that had further dislodged it?

Just before bedtime, Cernu's tooth came out. She showed
it to her mother.

Tifla had an idea. "Cernu, I want you to put your tooth
under your downpilt tonight ... so the tooth fairy can take
it!"

Cernu's eyes sparkled. She didn't know who-on-stellar

COMING IN THE MARCH ISSUE OF TODAY

Computers in Education

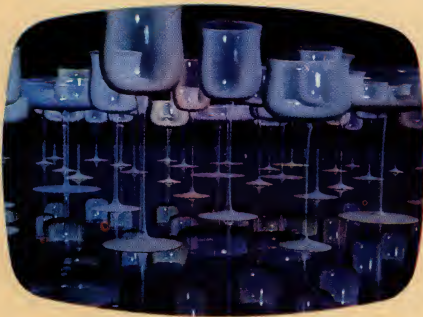
TODAY takes a comprehensive look at the role of microcomputers and networking in education.

You, Your Micro and the IRS

Are your networking on-line time charges driving you to distraction? Wondering if there is any way to offset the cost of a personal computer? There may be some relief at tax time.

Special Graphics Section

TODAY will present a special full-color section of computer-generated art from the Computer/OSU exhibition and an interview with William Kolomyjec, one of the coordinators of this extraordinary exhibit.



New Letters Section

Beginning with the March 1983 issue, TODAY magazine will publish a "Letters" section. We welcome your comments on the editorial content of TODAY for publication in this section.

Please address your letters to: Editor TODAY magazine, 5000 Arlington Centre Blvd., Columbus, OH 43220, or to CompuServe Email 70003,1372.

TODAY reserves the right to edit letters for length, content and clarity.

Discovery

Continued from pg. 47

the tooth fairy was, but she loved the games her mother invented. This was obviously another game.

Cernu did as her mother suggested, and nodded off to sleep with dreams of gamblers and tippers and video arcades. In the morning, when she awoke, she carefully lifted the downpilt. Her tooth was gone! But in its place was a slender white envelope. She opened it to find the funny piece of paper with George Washington's face on it. A whole dollar ... for her!

She ran to thank her mother. "I'll save it," she promised, "but if I did wish to spend it, what could I buy?"

Tifla chuckled. "Only one stick of Galaxy Gum, I'm afraid."

Cernu realized that wasn't very much buying power.

Tifla said, "And now you know the real reason they eliminated cash. It just doesn't buy much these days."



"NEVER MIND ALL THAT 'FORTRAN' JAZZ ---- JUST PLUG ME INTO THE ACTION!"

Conundrum Solution

from pg. 37

1. therapy
2. Homestead Act
3. Eliza
4. master
5. protocol
6. interview

Homesteading

Continued from pg. 19

the mid-sixties, Gingrich once helped develop a simple accessing system at Georgia Tech that offered students self-directed learning. His educational philosophy dovetails neatly with his political beliefs: a fierce conviction that self-sufficiency and hard work are the core strengths of countries as well as individuals.

"I think we're faced with a very simple crisis in America. The only way we are able to prosper is to maintain a population with a higher level of technology skills than anyone else," says Gingrich, who is a co-sponsor on the so-called Apple Bill (HR 5573) which proposes tax credits to companies donating computers to schools.

"The Family Opportunity Act can help solve this crisis," he maintains. "It's a wholistic bill and can affect many things. No single element would more transform America than to have the technological capital in the home where individuals own and control it."

Gingrich, who is beginning a second term in Congress, is undaunted about the initial lack of interest in the bill. He will, he insists, reintroduce the Family Opportunity Act every two years, if necessary. "It was introduced in 1982 just to start a dialog. This year," he says resolutely, "we're really going to run with it."

Carole Houze Gerber is a contributing editor to TODAY magazine.

7. commands
8. piracy
9. patents
10. phobias
11. psychology

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